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WAVE-LENGTHS IN THE ABSORPTION SPECTRUM OF NITROGEN PEROXIDE IN THE VISIBLE REGION BY MEANS OF A TWENTY-ONE-FOOT ROWLAND CONCAVE GRATING

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WAVE-LENGTHS IN THE ABSORPTION SPECTRUM OF NITROGEN PEROXIDE IN THE VISIBLE REGION BY MEANS OF A TWENTY-ONE-FOOT ROWLAND CONCAVE GRATING

I. HISTORICAL AND DESCRIPTIVE

The absorption spectrum of gaseous nitrogen peroxide was first observed by Brewster about 1833. When the light from a continuous source is passed through the gas, its spectrum consists of a great many narrow black lines[1], which for a thin layer of the gas lie chiefly in the blue and violet regions, but extend farther and farther towards the red when the thickness or density is increased[2]. The lines are grouped irregularly at intervals into regions of greater absorption. The fairly detailed description published by Brewster in 1860, though unsatisfactory because no scale was given for the wave-lengths, was the best[3] up to the time of Hasselberg's scholarly treatment in 1878.

Hasselberg used three direct-vision prisms[4] in train, and compared the positions of the lines due to nitrogen peroxide with those of the solar spectrum, for which wave-lengths were taken[5] from Ångström's "Recherches sur le Spectre solaire" of 1868. The point, previously contested, which he succeeded in establishing, was that the positions of the spectral lines are invariable[6] for different densities or lengths of path of the light in the gas. He used three different lengths of cell[5]: 0.75 meter, 1.18 meter, and 2.5 meter, at such densities that the color appeared deep red, orange-yellow, or light yellow. He worked at room temperature, and in the region 4630 to 6870 Angstrom units.

Bell[7], and also Liveing and Dewar[8], found that the lines are due to the NO_2, and that the N_2O_4 produces only a continuous absorption at the two ends of the spectrum.

Kayser concludes[2] that "Die einzige brauchbare Zeichnung und Messung des Spectrums verdanken wir Hasselberg".

A search of the "Chemical Abstracts" to date, and of the "Science Abstracts" beginning with 1903, failed to show any account of a table of wave-lengths for nitrogen peroxide with an instrument of larger resolving power than Hasselberg's. Attention was therefore turned to the preparation of the present table as a basis for the study of the unexcited molecule NO_2 by means of the series that may be traceable.

II. EXPERIMENTAL

A Rowland concave grating of twenty-one and a half feet radius of curvature and 14438 lines to the inch was used. It is on a Rowland mounting[9] upon concrete pillars on a separate foundation from the building. The slit has both jaws movable by means of a screw with graduated head. The final slit width adopted was 0.078 mm, as determined by a traveling microscope. As the plate-holder was moved to different regions of the spectrum, it was found necessary to re-focus slightly.

All measured observations were taken photographically. As source of comparison lines the 220-volt direct current (Pfund) iron arc was used according to the specifications of the International Astronomical Union as quoted in the "Scientific Papers of the Bureau of Standards", No. 478, page 264. An ammeter was kept in the circuit for constant attention. The arc was burned vertically, but the image of it as projected on the slit was made horizontal by two plane mirrors properly disposed. Thus the continual wandering of the arc about the vertical, which usually carries the image off the slit, was changed into a harmless shifting of the image lengthwise of the slit. Also it made certain that light from the central portion of the arc passed through the slit. The distance between the poles of the arc was maintained constant within the proper tolerance by observations on the image. The magnification was approximately equal to 6.1.

The principal source of continuous illumination was the positive crater of the right-angled, 220-volt, direct current carbon arc. To avoid the cyanogen emission bands, however, the Tungsarc was used for wave-lengths shorter than about 4800. It gives a continuous spectrum as far as 3914 A. It required considerably longer exposures, but had the compensating advantage of needing no adjustment (except to be started afresh if the line voltage went off even for a moment).

A Dubosoq achromatic projection lens brought the light to a focus upon the slit. Just in front of the slit was placed a cell containing the nitrogen peroxide. When the iron comparison spectrum was desired, the cell was removed and a plane mirror inserted before the lens to bring in the iron arc instead of the carbon arc. However, when the Tungsarc was to be used, it was placed nearer the slit, and focussed by means of the lens supplied with it.

For photographing the green and red portions of the spectrum, Wratten and Wainwright panchromatic plates, size 16x20 inches, were cut into strips 1 1/4 x20 inches and hypersensitized with a 10% solution of ammonium hydroxide. For wave-lengths shorter than 5000 A, Eastman Speedway plates size 14x17 inches were used in strips 1 1/4 x17 inches.

The scale of the instrument being 2.65 A per millimeter, a range of 1350 A was possible on the twenty-inch plates, and 1140 A on the seventeen-inch plates. Actually, the measurable region was considerably shorter, about 600 A being really sharp and good. This is attributed to two causes: (1) It was impossible to bend plates as thick as these to a curvature as great as that of the focal curve of the grating, hence the plate had to be eased out slightly at the ends, preventing perfect focus across the whole length. (2) The line absorption for a given cell is best for a fairly short region, about 600 A or less, being too heavy farther towards the blue, and too light towards the red.

The length of exposure (compare Table II) for the absorption spectrum was from one and a half to five hours, usually about two hours in the green and red, where the carbon arc could be used and a sensitized plate; and about four hours in the blue, where the Tungsarc had to be used. For the iron arc in the blue, twenty or thirty minutes were required, but longer would have been better, because more of the comparatively faint lines given as standards would have shown. In the green and red, two hours proved fairly good for the iron arc with the sensitized plate.

The exposure of a different part of the plate to each spectrum was accomplished by means of the Rowland diaphragm[10]. To guard against shifts, the comparison spectrum was given half of its required exposure before starting to photograph the absorption spectrum, and the other half afterward. In general, the comparison spectrum was put on the center of the plate, and the nitrogen peroxide spectrum toward the border, because this position gave greater length to the absorption lines and hence made them easier to see.

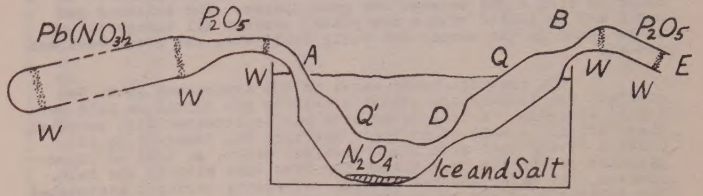

Fig. 1. Generator of Nitrogen Peroxide

To prepare nitrogen peroxide, Baker's Analyzed lead nitrate was heated, the products formed being given by the equation (see any textbook of inorganic chemistry[11]):

$$Pb(NO_3)_2 = PbO + 2NO_2 + O.$$

The lead oxide remains as a solid, and the gaseous nitrogen peroxide is condensed by a freezing mixture of ice with salt or calcium chloride, while the oxygen escapes.

Since NO_2 reacts with rubber and ordinary cements, an all-glass generator was used (Fig. 1). Phosphorus pentoxide was used as a drying agent at the places indicated, and glass wool at W kept the chemicals where desired. Liquid N_2O_4 collected in cell Q'. When the charge of lead nitrate was exhausted, the generator was sealed off at A with the blow-torch. The remaining portion was attached at E to an aspirator which is capable of giving a reduced pressure of two to four centimeters of mercury. The freezing mixture was replaced by a warm bath at 28 to 40°C to facilitate the evaporation of the liquid N_2O_4, which boils at 22°C. The heat of the room was not available fast enough to keep the N_2O_4 boiling, on account of the rapid cooling due to its evaporation. When roughly two-thirds of the liquid had disappeared, the tube having been heated with a flame meanwhile to about 70°C, the air and oxygen were believed to be fairly well flushed out, and the tube was sealed off at B, at the same time removing it from the warm bath to prevent the vapor pressure from blowing out the seal just as it formed, while still hot. Finally, a solution of carbon dioxide snow in acetone was ready in a heat-insulated vessel, and Q' was turned so that the liquid in the end A was chilled to the desired temperature. When equilibrium was believed to have been reached, Q was sealed off from Q' at D. Then Q contained only gaseous

$$N_2O_4 \rightleftharpoons 2\ NO_2$$

at reduced pressure, while Q' contained the liquid in contact with the vapor.

Heating Q now did not change the color of it much, since the number of molecules of NO_2 would increase only by the dissociation of some of the N_2O_4 gas, already largely dissociated because of the low pressure; but heating Q' caused the color to change from light yellow to orange, then dark brownish-red, since the supply of gas could be augmented indefinitely from the liquid. Above 150°C begins the decomposition[12] into nitrogen and oxygen, which is complete at 620°C.

TABLE I. DATA ON CELLS

Designation of Cell	Inside diameter cm	Contents	Plates using it
A	0.4	Vapor and liquid	C 29
F	8.0	" " "	C 58
L'	1.6	" " "	
P	1.9	Vapor only, sealed off from liquid at - 21° ± 2°C	C 66
Q	1.9	Vapor only, sealed off from liquid at - 14° ± 1°C	C 63 C 64 C 74
Q'	1.9	Vapor and liquid	C 60
L' + Q'	3.5	" " "	C 62

The cells used in the measured plates are designated by certain letters of the alphabet. Data concerning them are shown in Table I. It may be noted that for the cells without liquid, a reduced pressure of the vapor was obtained by sealing off from the liquid at a rather low temperature. The result was, to make the cell more transparent. We undercooled the liquid N_2O_4 to -25° or -30°C to cause it to solidify, and then let it warm up. Cell P was sealed off with the liquid in a bath at -23°C, the thermometer afterward put in again reading -19°C. Cell Q was likewise sealed off with the liquid in a bath at -15°C, the thermometer again put in afterward reading -13°C. The other cells used in the measured plates contained liquid as well as vapor.

The shape of most of the cells used was cylindrical. It did not disturb the focus of the light upon the slit appreciably when placed very close to it. If the cell was placed farther from the slit, the focus had to be readjusted through it. The cell F which was used in the red was spherical. Part of one plate was measured for which cell A had been used. Both A and F stood a chance of having some water-vapor diffused back into the cell in filling or sealing, since they were among the earlier cells made, when they were filled through a capillary inserted at the top, and sealed without having phosphorus pentoxide next to the aspirator. However, if water-vapor was present, it did not show in the plate using cell F, which gave excellent results. Cell A had such a small diameter that it was difficult to use, nor were the plates taken with it up to the later standard of sharpness, but part of one of them was measured in order to fill a gap between two good plates. The existing gap could not be filled with a new plate, because all exposures had to be taken in the summer and early fall, when the steam heat was not on.

The question arose early in the experiment as to how constant the temperature of the absorbing gas should be held during an exposure. A deep water-bath was constructed with parallel glass sides. A cell of nitrogen peroxide was immersed in it under a diving-bell with plane parallel sides, so that no uncompensated refraction took place, any more than without the bath. However, the water and the several reflecting surfaces diminished the intensity of the transmitted light so much as to prolong the exposures unduly, and the compromise effected was to let the portion of the cell through which the light passed, stand above the surface of the water.

A plate taken comparing an exposure with the bath at 4.0°±0.3°C and an exposure with the same cell of nitrogen peroxide (vapor above liquid) in air at room temperature, 26.0° ± 0.2°C, was examined under the microscope by two different observers, but no change in the position of the lines could be detected. This is in agreement with the work of Bell[7], Königsberger[13], and other investigators. Königsberger, freely translated, says that 'the position of spectral lines (absorption and emission lines) is completely independent of the temperature'. (The italics are his.) Nitrogen peroxide was one of the gases he was studying. Hence it was not necessary for me to make any special provision for controlling the temperature of the cells. They were used at room temperature, but for the sake of a record, a thermometer graduated in tenths of a degree Centigrade was suspended close to the cell and was read usually at least twice during an exposure.

On the other hand, changes in temperature of the grating constituted a serious difficulty. In the first order, the wave-length change with temperature[14] is 0.1 A per degree centigrade. Since there were at least two lines to the Angstrom, a change of two or three degrees during an exposure would blur the lines beyond recognition. The exposures were several hours long, as has been already mentioned. The Rowland mounting requires a fairly large room. To minimize convection currents, an enclosure was built around the grating, except the quadrant left open for the incident light. Electric lamps at the bottom of a sort of chimney could be used to send warm air up to the grating as a last resort.

A time for photographing was to be chosen such that the room temperature was changing most slowly, i. e., around a maximum or a minimum. The room of course had to be kept closed for several hours before beginning to photograph. The maximum temperature occurred about four or five o'clock in the afternoon, but, to combine the advantage of least stray light, the time chosen was, to start as soon as possible after dark, finishing by two o'clock in the morning. (To prevent an increase of fogging on the sensitized plates with age, we generally developed, fixed and washed them at once, and started them drying in front of an electric fan before we left the laboratory.)

Heat from the control rheostats with the carbon arc, and to some extent with the iron arc also, was inclined to cause the temperature of the grating to rise. By photographing at night, and using fans at certain doors, we were able to compensate for this rise by admitting cool air from outside. If on the other hand the temperature was going down due to a sudden fall in temperature outside, the electric heaters were used which warmed slightly the partial enclosure around the grating. (However, this was not often necessary). A thermometer graduated in tenths of a degree centigrade was kept hanging just behind the grating. Sufficient skill was developed to enable us to avoid oscillations of temperature and unsteady conditions.

Steam pipes at the ceiling made it impossible to photograph this absorption spectrum except in the summer and early fall. Though numerous attempts were made to assign the trouble to some other cause and eliminate it, the plates taken after the steam heat had once been turned on in the fall persisted in showing a shift of the comparison lines, half of the exposure of which had been made at the beginning, the other half at the end of the run. (Of course the "centers of gravity" of the absorption lines would still have their true positions with reference to the "centers of gravity" of the iron lines.) Plate C 74 was the best of these and was measured because it was in the second order; (the steam heat had been cut off and the room cooled out for hours beforehand); but no more photographs could be taken successfully.

III. PRECISION OF RESULTS

The temperature of the grating during an exposure was probably the greatest single factor affecting the precision of the results. For the measured plates, the maximum range of temperature occurring was 0.5 C, while for each of four plates it did not exceed 0.2°C, and the average range for a whole exposure was 0.3° C. Hence fluctuations in wave-length due to change in temperature of the grating, at the rate of 0.1 A per degree centigrade, did not exceed 0.03 A.

For measuring the plates a Société Génevoise measuring machine was used, with a plate-holder long enough to permit one of the twenty-inch plates to be measured without moving the microscope. The microscope was arranged for small magnification, about two, with cross-hairs at the focus.

Both because the scale of the photographic plates was not constant to more than 0.04% and because of diurnal changes in temperature of the measuring machine, after the first two plates each day's work was computed as a separate unit. From six to ten standard iron lines were measured in sequence with the absorption lines. From them the average constant

$$c = (\lambda_1 - \lambda) / (s_1 - s)$$

was computed, and substituted, together with the scale-reading s_0 and wave-length λ_0 of some chosen line of the run, in the formula

$$\lambda_1 = (\lambda_0 - s_0 C) + s_1 C .$$

The constant $\lambda_0 - s_0 C$ was set up in a Monroe Calculating Machine, Model K, and the constant c also; so that the machine never had to be cleared, but any wave-length followed at once from the preceding by turning the crank a suitable number of times. The process is, of course, simply a linear interpolation. The corrections on the computed iron lines were plotted against the wave-lengths, and the resulting correction applied to λ_1. An alternative method, used later, was to find by trial that correction which made the sum of the squares of the corrections a minimum. Scale readings were made to thousandths of a millimeter, and standard comparison wave-lengths[15] were given to thousandths of an International Ångström*. The results were rounded off to hundredths of an Ångström, and the average deviation from the mean for the same line in different plates for nitrogen peroxide was 0.03 A.

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*NOTE: However, iron lines being few in the region of the sodium D lines, and the latter being present, reversed, on my plates, I used them as two out of at least eight standard lines where they occurred (using Kaye and Laby's tabular values); but they seemed to increase the average deviation, so I stopped using them.

IV. COMPARISON WITH HASSELBERG

The wave-lengths are given to six significant figures, only the last being doubtful in most cases. The average deviation of a single observation is 0.03 A. Hasselberg gives five figures as significant in his results. His probable error[16], he thought, did not exceed 0.2 A. Later work on standard comparison lines leads one to believe that his systematic error may well be larger.

Hasselberg was not able to get farther in the blue than 4630 A, while the present table extends to 3978 A; on the other hand, he worked as far as 6870 A in the red, while this table goes only to 6323 A.

It appears from the great length of his cells[5] (75 cm his shortest, as against 8.0 cm my longest) that the nitrogen peroxide used by Hasselberg must have been considerably diluted with air. The amount of air present in my tubes was reduced to a minimum, though I made no determinations as to the effect of the presence of air upon the absorption spectrum.

The present measurements have the following advantages: (1) Greater resolving power was secured with the twenty-one-foot concave grating than he was able to get with prisms (2.65 A/mm compared with "eine recht bedeutende" dispersion). (2) Photographic methods, used here, are more precise than visual observations, which he used. (3) The standard lines here used were the Bureau of Standards interferometer measurements[15] of the Pfund iron arc, which are far better determined now than were the solar lines, which Hasselberg took from Ångström's table. (4) The continuous regions of the spectra of the carbon arc and Tungsarc, as here used, are better backgrounds for the nitrogen peroxide absorption than is the solar spectrum, which is itself a fine-lined absorption spectrum. Hasselberg had the solar and the NO_2 spectra superposed, and by rotating the cell out of the path of the light judged whether a line was due to one or the other, or to both[5].

Notwithstanding these facts, our results agree in the main. From his observations he made a drawing of the spectrum to scale which is remarkably like these photographs in the principal features. The greater resolving power of the concave grating makes any checking of wave-lengths with his, impracticable. His principal proposition, that the place of a line in the spectrum remains the same no matter what the state of the gas, so long as it is possible to distinguish the line[5], is supported. The same remark which he made about intensities applies here with equal force[17], namely that 'the relative intensities of the lines and bands have their full meaning only within regions for which the gas has the same density (or length of absorbing layer)'. That is to say, the relative intensities cannot be considered strictly comparable for different plates, taken with different cells or different lengths of exposure.

V. EXPLANATION OF TABLE OF WAVE-LENGTHS

The table of wave-lengths contains columns for: number (N) of photographic plates on which the line was measured; intensity (I) of the line; its wave-length (λ) in Ångströms; and the average deviation (d) of a single observation. The symbol * denotes resolved components; #, wave-lengths still further resolved.

TABLE II. DATA ON PLATES MEASURED

Plate No.	Temp. Cell °C	Length of Exposure NO_2 hr.	Length of Exposure Iron hr.	Range of Temp. of Grating °C	Portion Measured Ångströms
C 63	22.2	2.75	0.33	20.0 - 19.7	4077.13 to 5122.32
C 64	21.2	5.00	0.50	19.3 - 19.7	3978.67 to 4766.07
C 66	31.	3.50	0.33	26.4 - 26.6	4046.69 to 4691.02 4735.51 to 4747.55
C 74	24.6	4.00?	0.50?	23.8 - 24.1	4335.24 to 4821.92 4847.02 to 4861.50 4877.48 to 4896.69
C 60	24.	2.00	2.00	20.1 - 20.3	4973.77 to 5568.71 5603.65 to 5804.94 5839.04 to 5939.45 6118.18 to 6128.51
C 29	23.1	1.50	1.50	21.7 - 21.9	4768.14 to 5075.62 5094.59 to 5134.51 5202.50 to 5210.96
C 62	23.4	2.00	2.00	19.9 - 20.1	5351.12 to 5404.90 5463.50 to 6061.91 6113.15 to 6237.34
C 58	23.6	2.02	2.00	19.4 - 19.9	5931.61 to 6223.22

For data on plates measured, see Table II. Not more than four plates were measured in any one region. Three first-order plates and one second-order plate cover the region 4335 to 4897 A. One plate only was measured between 3978 and 4045 A; between 5134 and 5351 A; and for longer waves than 6237 A. At all other places at least two plates were measured; though in spots one of them often had absorption too heavy, or transmission too continuous, to be used.

The intensity (I) of a line is expressed by a number and a letter. The number represents the estimated width, 1 denoting the narrowest and 10 the widest. (Note: Since C 74 was the only measured plate taken in the second order, the number expressing estimated width of a line on it has been divided by two for comparison with the first order.) The character of the edge of the line is denoted by one of the four letters s, m, f, b;

s means sharp,
m " medium,
f " fuzzy,
b " barely perceptible.

The average deviation (d) of a single observation is given in hundredths of an Angstrom; i. e., it affects the last place, or at most the last two places of figures. Where a line was measured on but one plate, its average deviation is left blank in the table, but judging from the rest of the work, its error is of the order of 0.03 A.

VI. ACKNOWLEDGMENTS

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TABLE OF WAVE-LENGTHS IN THE ABSORPTION SPECTRUM OF NITROGEN PEROXIDE

N	I	λ	d	N	I	λ	d	N	I	λ	d
1	6b	3978.67		2	3f	4051.71	6	3	2f	4105.65	3
1	2b	9.76		2	2f	2.26	2	3	5m	6.37	4
1	2b	3980.37		2	2m	2.66	2	3	3f	7.17	4
1	3b	0.91		2	2m	3.06	6	3	3f	7.96	2
1	3b	1.80		2	4m	3.55	4	3	5m	8.63	3
1	6b	2.68		2	4m	4.20	1	2	3f	9.34*	8
1	3b	3.66		1	2b	4.69*		2	6f	9.96*	8
1	2b	4.21		1	4m	4.96		1	5f	9.99	
1	3b	4.80		1	3f	5.07*		1	1f	4110.36*	
1	3b	5.63		2	4m	5.86	6	3	2f	0.83	6
1	2b	6.73		2	5m	6.58	4	2	2b	1.32	6
1	2b	7.62		2	2f	7.22	6	3	4f	1.72	8
1	2b	8.09		2	2f	7.68	1	2	2b	2.28	3
1	2b	8.89		2	2b	8.10	2	1	2b	2.65	
1	1b	9.43		2	2f	8.50	2	3	2f	3.14	3
1	1b	9.90		2	2b	9.14	4	3	2b	3.75	2
1	3b	3990.86		2	4f	9.78	4	3	2f	4.22	2
1	1b	1.55		2	2m	4060.33	4	2	2b	4.65	4
1	4b	2.53		2	3f	0.85	0	3	5f	5.05	10
1	2b	4.04		2	6f	1.52	8	2	1b	5.66*	2
1	1b	5.09		2	2f	2.08	4	1	10b	5.95	
1	2b	5.62		1	3f	2.42*		2	2b	6.14*	2
1	1b	6.06		1	3b	2.59		3	2b	6.67	7
1	2b	6.67		1	1f	2.88*		2	2b	7.08*	9
1	2b	7.53		2	3f	3.30	2	1	5b	7.49	
1	2b	8.09		2	2f	3.68	2	2	4b	7.72*	18
1	2b	8.49		1	1f	3.95		3	2f	8.21	6
1	2b	9.21		2	4f	4.51	12	3	2f	8.74	2
1	3b	9.93		2	4b	5.15	11	2	3f	9.22*	8
1	4b	4000.48		2	3b	5.67	6	2	4b	9.51	6
1	5b	1.43		2	2f	6.20	6	1	1f	9.76*	
1	5b	2.09		1	2b	6.76		3	1b	4120.14	5
1	2b	2.60		2	2b	7.08	6	3	4f	0.69	12
1	3b	3.11		2	4f	7.56	4	3	3f	1.23	2
1	2b	3.53		1	2f	8.02		3	3f	1.83	4
1	3b	3.98		2	2b	8.42	8	3	2f	2.38	3
1	3b	4.51		2	3b	8.96	6	3	3f	2.98	4
1	2b	4.97		2	4b	9.62	4	2	2b	3.42	14
1	5b	5.54		2	2f	4070.12	2	3	7m	4.08	6
1	5b	6.22		2	3b	0.56	8	2	2b	4.88	4
1	5b	7.11		2	2f	1.05	3	3	5f	5.48	4
1	2b	7.61		1	2b	1.56		3	4b	6.17	8
1	2b	8.14		2	2m	2.02	2	2	3f	6.57	13
1	3b	8.76		3	4f	2.70	5	2	2f	7.08	8
1	2b	9.20		1	2f	3.26		3	4b	7.67	9
1	3f	9.84		2	3f	3.66	8	3	2m	8.29	1
1	3f	4010.60		2	2b	4.27	11	3	4f	8.90	4
1	3f	1.24		2	4f	4.92*	2	3	4f	9.72	5
1	3f	1.94		1	6b	5.17		1	1b	4130.06	
1	3b	2.42		1	2f	5.56*		3	5m	0.60	2
1	5b	3.03		2	5f	5.97	3	3	2m	1.21	5
1	4f	3.96		2	3f	6.52	7	3	2m	1.69	2
1	2b	5.19		3	4f	7.13	6	2	3f	2.04	12
1	3b	6.38		1	2b	7.61*		2	2f	2.47	5
1	4f	7.97		1	4f	7.87		2	4f	2.96	1
1	2f	8.63		1	4f	8.06*		1	3s	3.52*	
1	2f	9.15		2	2b	8.40	5	2	5m	3.64	8
1	2f	9.92		2	2m	8.92	2	1	2f	3.85*	
1	5f	4021.23		2	2f	9.32	2	3	2m	4.25	1
1	2f	1.95		3	9f	9.88	8	2	3m	4.66	2
1	2f	2.55		1	2b	4080.49		1	4f	5.18*	
1	2f	3.03		2	3f	0.99	3	2	8m	5.36	6
1	2b	3.93		2	2m	1.46	5	1	3b	5.95*	
1	2b	4.49		3	4f	1.98	2	3	6f	6.40	7
1	2b	4.92		1	1b	2.37		3	3f	7.11	8
1	2b	5.47		3	2m	2.75	3	1	3f	7.81*	
1	2f	6.36		3	2m	3.19	4	2	6f	7.91	1
1	4b	7.06		2	4f	3.82	2	1	2f	8.22*	
1	2m	7.77		2	2f	4.37	8	3	3f	8.66	5
1	1b	8.38		2	2b	4.71	5	1	3b	9.34*	
1	2b	8.99		3	2f	5.29	3	2	6f	9.36	2
1	2b	9.96		3	3f	5.77	4	1	3b	9.79*	
1	1f	4030.43		3	3b	6.43	1	3	2f	4140.25	3
1	3f	1.14		3	2b	7.06	9	2	4f	0.88*	4
1	3f	1.85		3	2b	7.56	4	1	5b	1.35	
1	4b	2.60		1	3b	8.02*		2	4f	1.40*	10
1	4f	3.10		2	5b	8.46	7	2	2b	1.80	2
1	1b	3.52		1	2b	8.65*		3	3f	2.34	6
1	2b	3.96		3	3b	9.19	6	3	3f	2.87	8
1	4m	4.48		2	4f	9.78*	1	2	3f	3.33	6
1	4f	5.24		1	10b	4090.19		2	3f	3.71	11
1	2f	5.95		2	3f	0.32*	2	3	4f	4.18	11
1	2b	6.68		3	2f	0.81	3	3	2f	4.67	8
1	1f	7.05		3	2f	1.44	2	3	3f	5.33	4
1	2m	7.66		3	3f	2.00	6	3	3f	6.13	5
1	2m	8.17		3	3b	2.48	3	3	2f	6.62	6
1	2f	8.60		2	2f	2.93	6	3	3f	7.28	8
1	1f	8.96		3	2f	3.39	4	1	2b	7.78*	
1	2f	9.35		2	2f	3.82	2	2	4m	7.86	6
1	3f	9.95		3	3f	4.28	10	1	1b	7.89*	
1	2f	4040.27		3	3b	4.63	4	3	2s	8.38	2
1	3m	0.64		2	2b	5.04	4	1	1b	8.97*	
1	5f	1.08		2	2m	5.60	10	2	4f	8.97	5
1	2f	1.55		3	5f	6.31	5	1	1b	9.36*	
1	3f	2.06		2	2f	6.76	2	3	2f	9.81	5
1	8f	2.76		3	4f	7.21	2	1	2f	4150.30*	
1	3f	3.58		2	3b	7.72	2	2	4f	0.48	3
1	2f	4.34		3	2f	8.24	4	1	3f	0.70*	
1	6f	4.93		3	2f	8.91	3	3	3f	1.33	6
1	2f	5.52		1	1b	9.34*		3	2f	1.88	6
1	1b	5.92		2	2b	9.72	8	3	4m	2.49	9
2	2f	6.72	2	1	1b	9.92*		2	2f	2.90	4
2	2f	7.08	1	1	1b	4100.17		2	2m	3.40	6
2	3f	7.72	4	3	6f	0.81	4	2	4f	3.90	7
1	1f	8.26		3	2f	1.50	5	2	2f	4.41*	7
2	6f	8.60	4	3	2f	2.03	5	2	2b	4.76	8
2	2b	9.03	6	3	5f	2.50	4	2	2b	5.04*	8
2	2f	9.40	0	3	8f	3.30	3	3	2b	5.65	10
2	2b	9.80	1	3	3f	4.19	6	3	3b	6.50	9
2	2f	4050.10	2	1	2b	4.54		3	2f	6.89	5
2	4f	0.69	2	3	6f	4.93	4	2	2f	7.35	2
2	3b	1.27	5	1	2f	5.27		3	3f	7.84	1

N	I	λ	d
3	4m	4158.61	3
3	4f	9.43	4
3	4f	4160.13	7
1	1f	0.61	
3	2f	0.84	8
3	4f	1.43	6
3	2f	1.96	3
2	6b	2.45	6
3	3s	3.25	7
1	2f	3.86*	
2	4f	3.96	6
1	2f	4.30*	
3	3f	4.69	8
3	4f	5.37	4
3	2f	5.86	2
3	3m	6.34	6
3	3f	7.09	3
3	2f	7.67	4
3	2b	8.12	4
3	3f	8.60	5
3	2b	9.17	11
3	2f	9.75	11
3	4m	4170.29	4
3	5m	0.96	6
3	2f	1.47	2
3	2f	1.89	1
3	3f	2.38	4
3	3m	3.05	5
2	2f	3.55	4
3	2f	4.02	7
2	2f	4.47*	1
1	6f	4.75	
2	2f	4.90*	1
1	2f	5.17	
3	3m	5.62	6
3	4m	6.46	3
2	2f	6.92	1
3	3m	7.37	2
3	7m	8.14	3
2	2f	8.63	1
3	3f	8.99	6
1	4s	9.68*	
2	4f	9.80	4
1	1f	4180.08*	
1	1f	0.40*	
3	2f	0.81	8
3	4b	1.38	9
1	1b	1.57	
3	3b	2.13	9
3	3f	2.64	10
3	2m	3.14	8
1	3s	3.45*	
2	3b	3.78	6
1	2m	3.92*	
2	2f	4.36	4
2	2m	4.86*	4
1	3f	5.01	6
2	4f	5.26*	6
2	2f	5.61	6
1	3f	6.05	
3	4f	6.32	4
2	2m	6.93	4
2	4f	7.50	4
2	2f	8.18	10
3	4f	8.90	11
3	3m	9.59	10
3	3m	4190.12	10
1	2f	0.59	
3	3f	0.96	3
2	2f	1.44	7
1	2f	1.75*	
1	4b	2.01	
1	3f	2.18*	
2	5b	2.44*	1
1	7m	2.88	
2	4f	3.04*	2
2	2b	3.53	6
2	2b	3.80	6
2	2f	4.15*	2
1	2b	4.27	
2	2f	4.54*	2
2	2f	5.10	4
3	2f	5.51	6
3	2f	6.08	7
2	3s	6.48*	6
1	5f	6.64	
2	2m	6.90*	4
3	3f	7.47	9
2	3m	8.00*	6
1	2b	8.30	
2	2f	8.62*	4
2	3f	9.25	12
1	2b	9.71	
3	2f	4200.08	10
3	3f	0.53	8
1	1b	0.82	
3	4b	1.36	8
3	4f	2.02	1
3	3f	2.62	4
3	3b	3.19	2
1	2b	3.26	
2	1b	3.62*	4
1	4f	3.84	
2	2b	4.04*	5
3	2f	4.46	2
1	2b	5.00*	
2	6m	5.16	12
1	1b	5.29*	
3	2f	5.66	2
3	2f	6.09	2
3	5m	6.74	2
3	2f	7.22	5
2	2f	7.60	2
2	4f	8.05	1
1	1f	8.41*	
2	9m	8.81	13
1	3f	8.92*	
3	2f	9.41	6
3	3f	4209.93	6
2	5m	4210.59	8
3	3f	1.38	4
3	2b	1.92	5
3	3m	2.42	7
3	4s	3.12	3
3	4m	3.84	3
3	2m	4.43	1
3	3f	4.89	2
3	3f	5.60	3
1	3b	6.07#	
1	4f	6.28*	
1	8f	6.41	
1	2b	6.46#	
2	4b	6.88*	4
2	3f	7.48*	4
1	6m	7.85	
2	2f	7.96*	6
2	2f	8.46*	2
1	8m	8.71	
2	3f	9.00*	3
1	3f	9.44*	
2	8m	9.62	2
1	3b	9.93*	
3	2f	4220.41	4
3	3f	0.99	5
3	3m	1.53	2
1	1b	1.97	
3	5m	2.33	4
3	5f	3.10	3
3	2f	3.84	4
3	2b	4.17	3
3	2f	4.71	2
3	4m	5.28	2
3	2f	6.00	0
3	6m	6.71	4
1	2f	7.44*	
2	6f	7.58	6
1	2f	7.81*	
2	2b	8.23	1
1	2f	8.58*	
2	6m	9.04	6
1	3f	9.17*	
3	2b	9.58	4
3	2f	4230.16	3
3	2b	0.64	1
2	2f	0.99*	1
1	2b	1.20	
2	2f	1.44*	0
3	3f	1.94	1
3	2s	2.51	1
2	2f	2.92	0
3	2f	3.32	0
2	2f	3.64	2
1	2b	3.99	
3	3m	4.43	3
3	3m	4.92	1
3	2f	5.55	3
2	2f	5.93	2
3	2f	6.33	1
3	2f	6.71	3
3	3f	7.23	4
1	3f	7.63*	
2	6f	8.02	2
1	3f	8.14*	
3	2f	8.57	2
3	2f	8.99	2
2	3f	9.45	2
3	3m	4240.07	4
2	2f	0.47	1
3	6s	0.95	2
1	1f	1.50	
3	2f	1.87	4
1	2f	2.32*	
2	4b	2.46	4
1	1f	2.61*	
2	2f	3.06*	2
1	4f	3.23	
2	2f	3.40*	1
3	2m	3.98	2
3	2m	4.40	0
3	2m	4.81	3
2	2f	5.24	2
3	2m	5.67	2
3	3f	6.27	1
3	2f	6.80	2
2	3b	7.32	1
3	3m	7.76	2
3	3f	8.35	3
1	1b	8.78*	
2	4f	9.00	4
1	2f	9.12*	
3	2f	9.56	8
3	2m	4250.01	2
3	3s	0.55	0
3	3f	1.26	5
3	2f	1.73	3
3	3b	2.25	3
2	3b	2.68	3
3	2f	3.07	4
2	1f	3.56	1
3	3f	3.98	3
2	2f	4.42	0
3	2m	4.90	1
3	3m	5.38	3
1	3f	5.64	
3	2f	6.04	1
1	1b	6.32	
3	2f	6.56	1
3	4f	7.07	3
3	3f	7.76	4
3	8f	8.40	3
2	2f	8.96	11
3	5f	9.43	6
2	2f	9.94*	2
1	4b	4260.18	
2	2b	0.35*	0
3	5b	1.02	9
3	3b	4261.63	17
3	2f	2.13	10
1	2b	2.56*	
3	4b	2.86	12
1	2f	3.10*	
3	2f	3.44	5
3	3b	3.89	6
3	2b	4.45	2
2	3f	4.98*	4
1	3f	5.17	
2	2f	5.61*	15
3	3f	5.86	7
3	2f	6.39	3
3	3f	6.92	4
3	2f	7.58	4
1	1b	7.91	
3	2f	8.26	2
2	2f	8.68*	6
1	5m	8.94	
2	2f	9.21*	19
2	2f	9.68*	12
1	3f	4270.08	
2	2f	0.14*	2
3	2f	0.46*	6
3	3f	0.72	4
3	2b	1.18	2
3	2f	1.64	5
2	2f	1.95	4
3	2m	2.42	1
3	2f	2.73	1
3	2f	3.12	2
1	2b	3.39	
3	3m	3.83	4
3	2f	4.45	4
3	2f	4.97	4
2	2m	5.30	0
1	2f	5.65	
3	2f	5.94	5
2	2f	6.36	1
3	3m	6.87	2
3	1f	7.36	5
3	5s	7.89	1
3	2f	8.39	1
3	2f	8.83	2
3	5m	9.44	2
1	1f	9.89	
2	1f	4280.16	2
1	2f	0.51*	
2	5m	0.74	3
1	3f	0.84*	
2	2f	1.32	4
3	2f	1.84	4
3	2f	2.42	6
3	2f	2.80	1
2	1f	3.14	4
3	2f	3.50	4
3	3m	4.12	2
3	2m	4.72	4
3	1f	5.09	2
2	2f	5.44*	1
1	3b	5.61	
2	2f	5.80*	2
3	2f	6.26	5
2	2f	6.78	8
3	3f	7.15	7
3	1f	7.62	1
2	2f	8.00	2
3	2f	8.49	6
3	3f	9.06	3
3	3f	9.70	5
1	2b	4290.24*	
2	4f	0.46	4
1	3b	0.80*	
3	3f	1.38	6
1	5b	1.51	
1	2b	1.95*	
1	2f	2.32*	
2	7m	2.54	1
1	3f	3.11*	
3	2f	3.43	8
3	2f	3.82	8
1	3f	4.22	
2	2f	4.58	5
3	3f	5.14	3
3	3m	5.82	2
1	2b	6.34*	
2	2f	6.64	0
1	3b	6.85*	
1	1f	7.07	
3	2m	7.47	2
3	3f	8.10	1
1	3f	8.59*	
2	3m	8.75	1
1	1f	8.92*	
3	2f	9.36	10
1	1f	9.72*	
2	6f	4300.08	1
1	2f	0.39*	
2	2m	0.78*	2
1	7m	1.33	
2	4m	1.88*	1
2	2f	1.86*	6
1	1b	2.17	
3	4m	2.46	2
3	2f	3.21	6
3	2s	3.70	1
3	3m	4.18	3
1	1f	4.90*	
2	4m	5.04	1
1	3f	5.23*	
3	3m	5.65	1
1	1f	6.00	
3	4s	6.40	1
3	3f	7.17	4
2	2f	7.65*	2
1	4m	7.86	
2	2f	7.96*	6
3	2m	8.52	2
3	3f	4309.02	3
2	2b	9.50	1
3	2m	9.85	2
1	3m	4310.34*	
2	4f	0.41	3
1	2f	0.69*	
3	2f	0.98	6
2	2f	1.50*	2
1	8b	1.87	
2	4f	2.00*	1
1	2f	2.63*	
2	9f	2.81	2
1	3f	3.01*	
3	2m	3.51	2
3	4f	4.13	6
2	3f	4.76*	2
1	10b	4.98	
1	2f	5.21*	
1	3f	5.62*	
2	6m	5.92	10
1	3f	6.28*	
3	4f	6.64	11
3	2m	7.18	5
2	2f	7.68*	6
1	3b	7.88	
2	3f	8.16*	14
3	5m	8.84	5
3	3f	9.55	5
3	2f	4320.08	5
1	2f	0.45*	
2	2f	0.57	9
1	2f	0.79*	
2	3m	1.38*	2
1	2b	1.89	
2	2b	1.95*	8
3	2b	2.34	7
1	3f	2.77*	
2	4f	2.89	0
1	2f	3.23*	
3	2f	3.58	5
1	2f	3.92	
3	3f	4.25	6
3	2f	4.94	5
3	3b	5.49	6
3	5f	6.24	1
2	3f	6.91*	4
1	5b	7.25	
2	3f	7.47*	2
3	3f	8.17	11
2	2m	8.78	6
3	3f	9.21	4
1	2f	9.59	
3	2f	9.90	3
3	5m	4330.51	2
3	3f	1.37	7
2	1f	1.75	1
3	2f	2.15	1
2	2f	2.48	1
3	3m	2.98	9
3	2f	3.52	2
2	2f	3.96	2
3	3f	4.48	6
2	2f	4.88	4
1	1f	5.24*	
3	3m	5.35	3
1	2f	5.48*	
3	2f	5.81*	4
1	5f	6.11	
2	3f	6.18*	4
2	2f	6.36*	4
1	1b	6.63*	
1	2m	6.71	
3	3f	6.83*	2
4	2f	7.22	3
1	1f	7.55*	
3	3f	7.68	2
1	2f	7.77*	
3	2m	8.10	3
1	1b	8.34	
4	4m	8.59	4
4	3m	9.08	2
3	3m	9.54	2
3	3m	9.84*	4
1	3f	9.99	
2	2f	4340.19*	4
2	2f	0.42	1
1	1f	0.61*	
1	2b	0.73	
1	1f	0.81*	
4	3f	1.04	4
2	2f	1.35*	4
1	2m	1.55	
3	2f	1.66*	3
1	1f	1.94	
4	4f	2.22	2
1	1b	2.51	
1	1f	2.73	
1	1f	2.91*	
3	7m	3.08	2
1	2f	3.16*	
1	1f	3.37*	
1	1b	3.58	
3	1f	3.76	3
2	2f	3.92	1
3	1f	4.07	4
1	1b	4.37	
2	2f	4.52	4
3	4m	4.80*	2
1	3f	4.98	
1	1f	5.11*	
3	3f	5.48*	2
1	4f	5.63	
1	1f	5.75*	
4	2f	6.09	3
1	1b	6.28	
4	2f	6.51	4
1	1f	6.83	
4	3f	7.03	2
1	2f	7.31	
4	3m	4347.63	2
1	2f	7.81	
1	1f	8.04*	
3	2m	8.13	1
1	2m	8.25*	
1	1b	8.44	
4	3s	8.74	3
1	1f	9.04	
4	2s	9.37	3
1	1b	9.70	
4	2s	9.82	3
4	6s	4350.28	2
1	2f	0.51	
1	1b	0.69	
3	2m	0.81	2
1	1m	1.09*	
3	2s	1.17	1
1	1m	1.26*	
1	1f	1.46*	
3	2s	1.60	2
1	2m	1.64*	
1	1m	1.95*	
3	2m	2.04	3
1	1f	2.19*	
1	1f	2.35*	
3	2m	2.42	1
1	1f	2.56*	
1	1m	2.82*	
3	7m	2.96	2
1	1f	3.04*	
1	1f	3.22*	
2	4f	3.46*	4
2	7m	3.58	4
2	2m	3.79*	5
4	3m	4.27	6
3	2f	4.56	4
1	1b	4.88*	
3	6f	5.10	1
1	2f	5.14*	
1	1b	5.38*	
1	1b	5.53	
4	2f	5.77	2
2	2f	6.11	2
2	2f	6.44*	4
2	4f	6.60	4
2	2f	6.84*	4
3	2f	7.17*	4
1	3f	7.28	
1	2f	7.43*	5
3	2f	7.72*	4
1	3f	7.87	
1	2b	8.03*	
1	1b	8.24*	
1	3m	8.37	4
3	2f	8.50*	6
1	2b	8.80	
1	3m	9.10	4
1	1b	9.32	
1	1f	9.56	
3	3f	9.74	2
1	1b	9.94	
1	2f	4360.16*	
3	3f	0.26	1
1	1f	0.37*	
4	3m	0.72	3
4	3m	1.17	2
1	1m	1.41	
4	3m	1.67	2
1	1f	1.99*	
1	1m	2.21*	
3	4m	2.23	2
1	1b	2.38*	
4	5m	2.93	3
1	1b	3.29	
3	3f	3.52	2
1	1b	3.79	
4	5f	3.97	7
1	1b	4.41	
1	1f	4.62*	
1	1f	4.82*	
3	4f	4.84	15
1	1b	5.00*	
2	2f	5.11	3
1	1b	5.30*	
1	2b	5.44	2
1	1b	5.50*	
1	1f	5.78*	
3	3f	5.87	1
1	1f	6.04*	
1	1b	6.29*	
2	2f	6.36	2
1	1b	6.52*	
1	1f	6.73*	
2	2f	6.93*	3
2	4m	7.02	4
2	2f	7.18*	1
2	2f	7.32*	
3	2m	7.56*	5
1	2f	7.75	
3	2m	7.87*	2
4	3m	8.24	2
1	1b	8.54	
2	2m	8.72*	2
2	3m	8.81	3
2	2m	8.98*	2
4	3f	9.35	2
1	1b	9.58	
1	1f	9.77*	
1	1f	9.94*	
3	4m	9.97	2
1	1f	4370.15*	
2	3f	0.51*	2
2	3f	0.80	3
1	2b	0.87*	
1	1m	1.13*	
4	2f	1.43	5
1	1b	1.68	
1	2f	1.87*	
3	2f	1.89	1
1	1b	4372.08*	
1	2b	2.29#	
1	4f	2.51*	
1	1b	2.61#	
2	3f	2.64	1
1	1b	2.78*	
2	3f	3.04*	8
1	1b	3.30*	
2	6f	3.33	4
2	2f	3.50*	0
1	1b	3.72	
1	1b	3.92*	
1	3f	4.03	
3	2b	4.19*	2
2	2f	4.56*	0
2	3f	4.73	6
1	1b	4.93*	
4	3f	5.23	2
1	1b	5.41*	
2	2f	5.59	2
1	1b	5.70*	
4	3f	6.02	3
1	1b	6.24	
3	2f	6.51	5
2	2b	6.76	3
4	2f	7.12	6
1	1b	7.36*	
1	2b	7.56	
1	1b	7.69*	
4	2f	7.89	6
1	1b	8.24	
4	3f	8.46	4
1	1b	8.80*	
1	2f	8.91	
2	2f	8.98*	2
1	2b	9.30	
1	1b	9.47	
4	3f	9.62	4
1	1b	9.85	
1	1b	4380.01*	
3	2f	0.15	2
1	1b	0.33*	
2	1f	0.60	4
1	1b	0.89*	
2	4f	1.04	2
2	3f	1.18*	1
1	1b	1.52	
1	1b	1.71*	
3	3f	1.82	3
1	1b	1.98*	
2	2f	2.24	1
1	1f	2.45	
4	3f	2.61	3
4	2f	3.09	4
1	1b	3.30	
1	1b	3.53*	
1	1f	3.71*	
3	3f	3.73	2
1	1f	3.87*	
2	1b	4.12*	5
2	3f	4.39	4
2	2f	4.53*	1
1	1f	4.81	
1	1b	5.01*	
3	4m	5.02	4
1	1f	5.22*	
3	3m	5.54	4
1	1f	5.73*	
1	7s	5.85	
3	3m	5.96*	2
2	2f	6.28*	0
1	3m	6.50	
1	1f	6.53#	
1	3m	6.66*	
1	1b	6.77#	
2	3b	7.02*	1
2	2m	7.12	0
1	1f	7.18*	
1	1b	7.38	
1	1f	7.56*	
3	4m	7.71	4
1	1f	7.86*	
3	3m	8.20	3
3	3f	8.42	8
1	1m	8.79*	
3	3f	8.89	1
1	1f	9.08*	
1	1b	9.28	
4	2m	9.47	5
2	1m	9.68	3
4	2s	9.94	3
4	3m	4390.31	2
1	1f	0.56	
3	3f	0.78*	5
1	6m	0.96	
2	2f	1.18*	4
3	2b	1.48	2
1	1b	1.73	
4	2s	1.96	2
2	2m	2.27	1
1	1b	2.45	
4	4m	2.62	4
1	1b	2.85	
1	1f	3.00*	
2	2m	3.06	2
1	1m	3.16*	
4	4m	3.47	3
1	1f	3.72	
1	1f	3.93*	
3	3s	4.03	6
1	1b	4.11*	
1	1b	4.27	
1	1f	4.28*	
1	2f	4.32	
1	1f	4.46*	
4	2f	4.69	3
1	1f	4.89	
3	2f	5.18	2
1	1f	5.39	

N	I	λ	d
2	2f	4395.57	5
1	2f	5.87*	
3	4m	5.89	4
1	1f	6.05*	
3	2f	6.31	3
2	2b	6.56	1
1	1f	6.84*	
3	2f	6.88	4
1	1f	7.05*	
1	1b	7.27*	
2	2f	7.36	2
1	1b	7.49*	
4	2f	7.78	3
1	1b	7.98*	
3	2f	8.17	3
1	1f	8.42#	
1	3f	8.56*	
1	2f	8.69#	
1	1f	8.92*	
2	7m	8.92	4
1	1f	9.14#	
1	2f	9.30*	
1	1b	9.36#	
1	1b	9.52#	
4	3f	9.79	2
1	1b	9.95	
1	1b	4400.10	
2	3f	0.28*	2
2	4m	0.40	2
1	1b	0.58*	
2	2f	0.72	0
1	1b	0.90	
1	1b	1.08	
4	3f	1.28	4
1	1b	1.51#	
1	2f	1.63*	
1	1b	1.69#	
1	1b	1.87*	
2	3f	1.89	5
1	1b	2.11#	
1	2f	2.20*	
1	1b	2.34#	
1	1b	2.53*	
3	3f	2.60	4
1	1b	2.74*	
1	1b	2.91	
4	1f	3.09	3
1	1b	3.34	
3	2f	3.53*	3
1	5f	3.82	
1	1b	3.83#	
2	3m	3.94*	0
1	1f	4.04#	
2	2b	4.44*	1
2	4f	4.52	1
1	1b	4.72*	
4	2f	4.98	4
3	2f	5.35	2
1	1b	5.71	
1	1b	5.88*	
3	4f	5.96	5
1	1b	6.10*	
1	1b	6.31	
1	1b	6.55*	
3	3f	6.62	2
1	1f	6.71*	
1	1b	6.91	
1	1f	7.12*	
3	4f	7.20	1
1	1f	7.38*	
3	2b	7.63	3
2	2b	7.86	2
3	2f	8.12*	1
1	2f	8.24	
2	2f	8.38*	4
1	1b	8.61	
4	2m	8.84	1
1	1f	9.04	
4	2f	9.34	4
1	1b	9.73	
1	1b	9.93*	
3	4m	4410.01	4
1	1b	0.30*	
3	2f	0.60*	2
1	3b	0.76	
3	3f	1.02*	6
3	2b	1.37	7
1	1b	1.51*	
1	3f	1.64	
1	1b	1.75*	
2	2f	2.01*	1
2	3f	2.14	2
1	1b	2.27*	
3	1f	2.53	4
2	2b	2.78	4
1	1b	3.06*	
3	2f	3.25	3
1	2b	3.35*	
3	2f	3.68	1
3	2b	4.06	2
2	2f	4.20	2
2	1f	4.42*	1
1	2f	4.63	
3	1f	4.76*	2
2	2f	5.05*	2
1	3f	5.18	
2	2f	5.39*	5
4	2f	5.58	4
1	1f	5.96*	
3	2f	6.07	4
1	1b	6.18*	
1	1b	6.32*	
4	2m	6.66	4
1	1f	6.87*	
4	3f	7.21	3
1	1f	7.60	
1	1f	7.81*	
3	4f	7.88	1
1	1b	8.00*	

N	I	λ	d
3	2f	4418.50	1
2	3f	8.76*	2
2	2f	8.98	2
1	1b	9.09*	
1	1b	9.42*	
3	2f	9.51	1
1	1b	9.69*	
1	1b	9.91*	
3	3f	4420.04	0
1	1b	0.26*	
3	2f	0.63	4
1	1b	0.84	
4	4f	1.06	2
1	1b	1.31	
3	2f	1.54	0
1	1b	1.74	
1	1b	1.92	
4	3f	2.10	8
1	1b	2.37	
4	2f	2.54	4
3	2f	2.88	1
4	2b	3.27	5
3	4f	3.74	4
1	1f	3.86*	
1	4f	3.96	
1	1b	4.12*	
3	2f	4.25	3
1	1b	4.57*	
1	1b	4.75*	
3	3f	4.76	3
1	1b	5.00	
1	1b	5.23	
4	2f	5.51	1
1	1b	5.77	
4	2f	6.03	5
2	2b	6.34	3
1	1b	6.48*	
3	3f	6.67	6
1	1b	6.70*	
1	1b	6.87*	
2	2b	6.98	4
4	2f	7.32	2
1	1f	7.52	
1	1f	7.77	
4	3f	7.96	2
1	1f	8.18	
3	2f	8.45*	4
1	4b	8.66	
1	1b	8.71#	
2	2f	8.80*	2
1	2b	8.87#	
1	1b	9.14#	
1	2f	9.25*	
1	1b	9.38#	
1	1b	9.53#	
2	4f	9.56	6
1	3f	9.71*	
1	1b	9.74#	
1	1b	9.89#	
3	2f	4430.10	2
1	1f	0.36*	
1	4f	0.53	
3	2f	0.63*	0
4	2f	1.07	3
1	1b	1.28	
3	3f	1.53	4
2	2f	1.70	2
3	2f	2.03	2
1	1b	2.25	
4	3f	2.50	3
2	2f	2.91*	1
1	2b	2.98	
1	1b	3.15*	
3	2f	3.40	3
1	1b	3.58*	
1	4b	3.65	
1	2b	3.76*	
1	2b	4.00*	
3	4f	4.08	7
1	2b	4.23*	
1	1b	4.42	
3	3b	4.74*	5
2	2b	5.06*	2
1	3b	5.07	
2	2b	5.22*	4
4	3b	5.53	3
2	2b	5.83	2
1	1b	6.06*	
1	3f	6.18	
3	2f	6.33*	3
1	1b	6.58#	
1	3f	6.74*	
1	2f	6.87#	
2	4f	6.88	2
2	2f	7.16*	2
1	1b	7.37	
4	3f	7.58	1
1	1b	7.89	
2	2b	8.08	4
2	2b	8.30*	1
1	4f	8.44	
2	2f	8.58*	2
4	2f	9.01	2
2	2b	9.42*	2
1	2b	9.56	
2	2b	9.74*	2
2	2f	9.90	4
1	2b	4440.30*	
3	6f	0.46	3
1	2b	0.60*	
1	1b	0.79	
1	2f	1.05*	
3	4m	1.18	2
1	1b	1.29*	
1	1f	1.60*	
2	2f	1.68	1
1	1f	1.85*	
4	3m	2.13	2
3	3f	2.60*	2

N	I	λ	d
1	8f	4442.90	
2	2f	3.00*	2
2	2m	3.12*	4
1	1b	3.43*	
3	2m	3.55	2
1	1b	3.64*	
1	1b	3.88*	
2	2f	3.94	2
1	1b	4.05*	
1	1b	4.23*	
2	3f	4.34	2
2	2f	4.45*	1
1	1b	4.71*	
2	2f	4.78	0
1	1b	4.87*	
2	2f	5.07*	4
2	3f	5.36	4
2	2f	5.46*	1
3	3m	5.90*	4
1	8s	6.13	
1	1f	6.15*	
3	2m	6.29*	2
4	2s	6.62	1
4	2m	7.00	3
4	3s	7.42	1
2	2f	7.80*	4
2	6s	8.02	6
2	2f	8.08*	6
1	1b	8.57*	
3	4m	8.74	1
1	2f	8.82*	
4	3s	9.23	3
1	2f	9.64*	
3	3f	9.74	4
1	1f	9.93*	
3	2f	4450.14*	4
1	5b	0.32	
3	2f	0.49*	1
4	2m	0.85	2
1	1f	1.22*	
3	3m	1.35	3
1	1f	1.49*	
4	3m	1.94	2
4	4s	2.52	2
1	1b	2.85	
2	2b	3.05*	4
2	2b	3.42#	4
1	5b	3.47	
1	3b	3.60*	
2	2b	3.72#	2
3	3f	4.02*	1
1	3b	4.14	
1	1b	4.23*	
2	2b	4.44	2
2	2b	4.62	4
2	2f	4.88	1
2	2f	5.06	4
1	1f	5.32*	
3	3f	5.44	1
1	1b	5.52*	
2	2f	5.74	4
4	2f	6.09	3
1	1b	6.43*	
2	2f	6.54	2
1	1b	6.60*	
3	3f	6.92*	2
1	3f	7.02	
1	1b	7.10*	
2	1f	7.31*	1
2	2f	7.44	1
1	1b	7.51*	
2	2b	7.70*	6
1	1b	8.02*	
3	2f	8.12	2
1	1b	8.26*	
1	1b	8.39	
3	2f	8.55*	3
1	4b	8.86	
1	1f	8.88#	
2	4f	9.04*	2
1	1f	9.16#	
1	2b	9.46*	
3	4f	9.59	0
1	1b	9.74*	
1	1b	4460.24	2
2	2f	0.32*	2
1	1b	0.59	
1	1b	0.93	
3	3f	1.15*	5
1	6f	1.32	
2	2b	1.52*	4
1	3b	1.70#	
1	1b	1.86*	
1	1b	2.08#	
2	2b	2.24*	
1	6f	2.31	
1	1b	2.33#	
3	2b	2.66*	2
1	1b	2.99*	
1	2b	3.12	
2	2f	3.30*	2
3	2b	3.62*	4
1	8f	3.92	
3	3b	3.99*	4
1	1b	4.27*	
1	1b	4.56*	
1	1b	4.81*	
3	4f	4.88	2
1	1b	5.06*	
4	2f	5.45	4
1	1b	5.81	
4	3f	6.03	5
4	3f	6.50	4
1	1b	6.92	
1	2b	7.07*	
3	5f	7.22	1
1	1b	7.25*	
1	1b	7.41	
2	2f	7.83*	1

N	I	λ	d
2	2f	4468.19*	3
1	1b	8.72#	
1	3f	8.79*	
2	8f	8.92	1
1	1b	8.96#	
1	1b	9.20#	
1	2b	9.33*	
1	1b	9.49#	
1	2f	9.71*	
3	3m	9.86	3
1	1b	9.93*	
1	1f	4470.24	
4	3f	0.54	3
1	1b	0.84	
2	2f	1.08	4
1	1b	1.32	
4	2m	1.55	6
1	1b	1.80	
4	2f	2.10	1
1	1f	2.38	
4	2m	2.62	4
4	3f	3.00	4
1	1f	3.25*	
1	1f	3.54*	
3	3f	3.56	2
1	1f	3.79*	
1	1f	4.00*	
3	4m	4.16	3
1	1b	4.19*	
1	1f	4.37*	
2	2m	4.62*	1
2	4f	4.76	4
1	1f	4.79*	
1	1f	4.98*	
4	2m	5.22	2
2	2m	5.74*	4
2	8s	5.98	4
1	1b	6.02#	
1	3m	6.18*	
1	2b	6.27#	
1	2b	6.58*	
3	5m	6.82	2
1	2b	6.86*	
1	1b	7.10*	
1	1b	7.32	
4	3f	7.51	6
1	1f	7.82	
4	3m	8.06	3
1	1f	8.30	
4	3m	8.53	3
1	1f	8.71	
4	4s	9.10	1
2	1m	9.51*	3
2	4f	9.69	2
2	1m	9.77*	2
3	2f	4480.08	7
1	1f	0.29	
2	2f	0.43*	3
2	2m	0.67*	1
2	4s	0.68	2
1	1m	0.83*	
1	1f	1.10*	
3	3m	1.23	5
1	2f	1.35*	
1	2b	1.73*	
3	3f	1.89	2
1	1b	1.97*	
1	1f	2.11*	
2	2m	2.29	4
1	1f	2.52*	
3	3f	2.66	2
1	1f	2.68*	
1	1f	2.85*	
3	3m	3.12*	2
1	7m	3.30	
1	1f	3.33*	
3	2f	3.62*	1
1	2b	3.98*	
1	3f	4.14	
3	4m	4.26*	2
1	1f	4.52	
4	3f	4.77	5
1	1f	5.02	
1	1b	5.23*	
1	1f	5.47*	
3	4f	5.50	4
1	2b	5.72*	
1	2b	6.03*	
2	3f	6.18	1
2	2f	6.32*	2
2	2f	6.66	2
2	2f	6.86*	2
1	2b	7.08	
2	2f	7.19*	5
1	3f	7.38#	
2	1f	7.50*	1
4	3f	7.85	3
1	1b	8.03	
2	2f	8.36*	2
2	3f	8.50	4
2	1f	8.69*	2
1	1f	8.84	
4	2m	9.02	6
3	2f	9.40	1
1	1b	9.71	
4	2f	9.92	5
1	1b	4490.28*	
3	4f	0.46	4
1	1f	0.54*	
1	1b	0.76*	
4	2b	1.08	4
1	1b	1.39*	
3	2b	1.47	3
1	1b	1.60*	
4	3f	1.87	3
1	1b	2.21	
1	2b	2.43*	
3	3f	2.56	0

N	I	λ	d
1	1b	4492.74*	
1	1b	2.98	
4	2f	3.17	4
1	2b	3.55*	
3	4f	3.66	3
1	1b	3.82*	
1	1b	4.07*	
3	2f	4.16	4
1	1b	4.31*	
2	2b	4.56	1
1	1b	4.83*	
3	3f	4.96	4
1	1b	5.08*	
1	1b	5.26	
1	1b	5.51*	
3	4f	5.63	3
1	1b	5.75*	
1	1b	5.97#	
1	2b	6.13*	
1	1b	6.25#	
2	4f	6.41	0
1	1b	6.56#	
1	3b	6.66*	
1	1b	6.79#	
1	2b	7.00*	
3	3f	7.11	3
1	1b	7.25*	
1	2b	7.55*	
3	3m	7.69	4
1	1b	7.82*	
1	1b	8.08*	
3	3f	8.26	0
1	1b	8.42*	
3	2f	8.71*	3
1	3f	8.99	
3	3f	9.11*	4
1	1b	9.29	
2	2b	9.51	5
2	2f	9.68*	1
1	5f	9.85	
3	3f	4500.05*	3
1	1b	0.22	
2	2b	0.50*	2
2	2b	0.78*	4
2	7f	0.78	4
1	2f	1.05*	
3	2f	1.36	3
1	1b	1.70*	
3	3f	1.82	3
1	2b	2.01*	
4	3f	2.36	2
1	1b	2.59	
2	2f	2.80*	1
1	2f	3.00#	
2	2f	3.12*	1
1	1b	3.33*	
2	4f	3.36	1
2	2f	3.50*	2
1	1b	3.70*	
3	2b	3.81	2
1	1b	3.93*	
1	1f	4.18*	
3	4f	4.33	2
1	2f	4.44*	
3	2m	4.85	4
4	3m	5.28	2
2	2f	5.68	2
2	2b	5.86	2
3	2b	6.03	2
4	3b	6.44	4
1	1b	6.70*	
2	2f	6.83	2
1	1b	7.01*	
3	3b	7.26*	2
1	2f	7.43	
2	2b	7.61*	5
2	2f	7.86	2
2	2b	8.08*	2
1	2b	8.30#	
2	2b	8.38*	2
1	3f	8.57	
3	2f	8.69*	2
1	1b	8.96	
4	3f	9.23	4
2	2f	9.52	1
1	1b	9.76*	
3	4f	9.90	1
1	1b	9.97*	
1	1b	4510.24*	
2	2b	0.40	2
4	3f	0.76	6
1	2f	1.03	
1	1b	1.21*	
2	3f	1.34	1
2	2f	1.49*	4
2	2f	1.70	4
2	2b	1.90	4
4	2f	2.24	6
3	2f	2.66	9
1	1b	2.91	
4	3m	3.14	2
1	2b	3.49	
3	2f	3.67	4
3	2f	4.00	3
2	2b	4.20*	4
3	2b	4.60*	6
1	3f	4.78	
3	2b	4.99*	5
1	1b	5.34*	
3	2f	5.48	2
1	1b	5.57*	
1	2b	5.83*	
1	2f	6.02	
3	2f	6.15*	
4	3f	6.51	3
2	2f	6.88	1
2	3b	7.09	2
2	2f	7.28*	4

N	I	λ	d
2	2f	4517.53	2
2	2f	7.61*	1
1	1b	7.93*	
3	2f	8.01	3
1	1b	8.20*	
3	2f	8.48	2
1	1b	8.72	
3	4f	8.91	4
2	2b	9.18	2
1	1b	9.38*	
1	2f	9.48	
2	1f	9.60*	1
1	1f	9.76*	
2	2f	9.92*	2
2	4m	9.98	2
2	2f	4520.20*	2
1	1b	0.36*	
1	2b	0.44	
2	2f	0.60*	2
2	2f	0.83	1
1	1b	1.05	
1	2b	1.13*	
3	4f	1.28	3
1	2b	1.44*	
1	1b	1.71*	
3	3f	1.85	1
1	2b	1.91*	
4	3f	2.34	2
1	1b	2.45	
4	4m	2.86	2
2	1f	3.28#	5
1	6f	3.48*	
2	2f	3.54#	4
1	8m	3.60	
2	2f	3.92*	6
1	1b	4.14*	
2	2f	4.29	1
2	2f	4.36*	1
2	2m	4.64*	4
2	6f	4.84	1
1	1b	4.86*	
2	2f	5.14*	1
1	1b	5.30	
1	1f	5.61*	
3	5f	5.76	5
1	1b	5.84*	
1	2b	6.12*	
3	2f	6.43	2
1	1b	6.65*	
2	6f	6.80	1
1	2b	6.95*	
1	4f	7.16#	
3	1m	7.23*	4
1	1b	7.64	
3	2f	7.83	2
4	3f	8.15	7
1	1b	8.58*	
3	3m	8.66	4
1	1b	8.78*	
1	1b	9.06	
2	2b	9.28	2
1	1b	9.45	
4	2f	9.62	2
4	2f	4530.19	3
3	2f	0.59	5
4	4f	0.96	10
4	3s	1.60	2
1	1f	1.92	
3	2f	2.21	4
4	2f	2.67	4
3	2f	3.08	2
2	1f	3.20	2
1	2b	3.41*	
3	4f	3.64	1
1	2b	3.67*	
1	1b	3.87*	
2	1f	4.12	4
4	3f	4.46	5
1	1b	4.72	
4	3f	4.98	1
1	1b	5.22	
2	2b	5.47	5
2	2b	5.66	6
2	2f	5.96*	6
2	6f	6.23	1
2	2f	6.31*	6
1	1b	6.60*	
4	2f	6.97	2
4	1f	7.40	3
1	1f	7.62	
2	2f	7.82*	4
2	4f	8.00	3
2	2f	8.20*	2
4	1b	8.60	4
1	1b	8.86	
4	3f	9.16	4
3	2b	9.64	6
4	1f	4540.04	3
3	2b	0.43	4
4	3f	0.84	2
1	1f	1.11	
4	2f	1.42	4
1	2f	1.72*	
1	3f	1.87	
3	2f	2.04*	4
1	1f	2.42*	
3	3f	2.52	1
1	2f	2.64*	
1	1b	2.96*	
3	3f	3.11	1
1	1b	3.22*	
2	2b	3.44	4
1	1f	3.72*	
3	3f	3.91	7
1	1b	4.00*	
1	2b	4.31*	
1	1f	4.54	
4	4s	4.88	3

N	I	λ	d
1	1f	4545.13	
3	1f	5.32	2
1	1b	5.61*	
3	2f	5.71	2
1	1f	5.85*	
4	2m	6.17	3
3	1m	6.46	2
3	1m	6.68*	3
1	3m	6.85	
3	2m	6.96*	2
4	3s	7.40	4
1	1f	7.76	
1	2f	8.04*	
3	4m	8.04	2
1	1b	8.37*	
4	2m	8.61	1
4	2m	8.96	2
4	2f	9.38	4
1	2f	9.61	
1	1f	9.87‡	
1	5f	9.98*	
2	5m	4550.02	0
1	2f	0.09‡	
2	1f	0.32*	2
1	1b	0.65‡	
2	6m	0.80*	1
1	1f	0.85‡	
1	6s	0.85	
1	1b	1.19‡	
1	3f	1.38*	
3	1f	1.48‡	4
4	2m	1.88	3
3	2b	2.32	2
1	1b	2.57‡	
2	3f	2.68*	5
1	2b	2.86‡	
1	6b	2.98	
2	2b	3.13*	0
2	2f	3.34*	2
1	1b	3.64‡	
2	2f	3.71*	4
1	1f	3.85‡	
1	1b	4.05‡	
1	8f	4.11	
1	3f	4.16*	
2	3b	4.35‡	4
1	2b	4.65	
3	3f	5.05	5
1	1b	5.26	
1	1b	5.52‡	
2	3b	5.60*	2
1	1b	5.75‡	
1	3b	5.76	
3	2f	6.11*	2
1	1b	6.38	
4	2f	6.66	2
1	1b	6.95	
1	1f	7.14*	
3	4f	7.23	2
1	1b	7.41*	
1	1f	7.77*	
2	3f	7.86	1
1	1b	8.03*	
4	4m	8.39	3
2	2b	8.78	10
4	2f	9.02	4
1	1b	9.27	
2	2b	9.49*	2
2	3f	9.76	8
1	1b	9.77*	
2	2b	4560.00*	3
4	2f	0.42	4
4	2f	0.90	4
1	1b	1.15	
3	2f	1.38	2
3	2m	1.81*	2
1	5m	1.94	
2	2f	2.12*	4
2	2b	2.37	3
1	1b	2.55	
2	2f	2.77*	1
2	3m	2.90	9
2	2b	3.25*	10
1	1b	3.57*	
3	3s	3.71	3
1	2b	3.89*	
3	2f	4.17	3
4	2m	4.54	3
1	1b	4.88*	
2	3f	5.14	4
2	3b	5.26*	2
2	2b	5.54*	1
1	3b	5.76	
2	2b	5.92*	1
2	2b	6.12	2
3	3f	6.47	6
2	1f	6.82	4
1	2b	7.00*	
1	3b	7.14	
3	3b	7.26*	3
1	1b	7.61*	
1	2b	7.73	
3	3f	7.84*	1
3	2f	8.32*	7
1	4f	8.48	
2	2f	8.63*	1
2	1b	8.92	1
4	5m	9.27	2
1	1b	9.56	
3	2f	9.88	3
1	2b	4570.11	
4	4f	0.49	3
2	2f	0.88*	2
1	2b	1.06	
1	1f	1.16*	
3	2f	1.42	3
1	1f	1.79*	
3	3f	1.93	5
1	2f	4572.02*	
1	1f	2.25	
3	2f	2.43	1
2	2b	2.79	4
1	1b	2.95	
1	2b	3.18*	
3	4f	3.30	2
1	1f	3.43*	
2	2b	3.75	6
1	1b	4.03*	
3	3m	4.17	2
1	1f	4.24*	
1	1b	4.59	
4	2s	4.94	4
1	1b	5.24	
4	3f	5.51	4
1	1f	5.78	
1	1b	6.11‡	
1	3b	6.19*	
2	6f	6.30	2
1	1b	6.34‡	
1	1b	6.57‡	
1	2b	6.67*	
1	1f	6.97	
3	2f	7.18	4
4	2f	7.49	2
4	2f	7.87	3
1	1b	8.10‡	
1	2f	8.29*	
1	1f	8.41‡	
2	4f	8.48	4
2	2f	8.64*	1
4	3m	9.03	2
1	1b	9.24	
1	1b	9.48*	
1	4m	9.61	
3	4f	9.73*	2
1	1f	9.96	
1	1b	4580.11*	
3	2m	0.23	3
1	1f	0.34*	
2	1f	0.60	1
3	3f	0.90*	5
1	3f	1.08	
1	1f	1.27*	4
1	1f	1.46‡	
1	3b	1.65*	
1	2b	1.79‡	
2	5m	1.86	1
1	2b	2.03*	
2	1f	2.22	2
2	2b	2.47*	0
1	2b	2.72*	
1	7b	2.76	
3	3b	2.90*	4
3	2b	3.34	2
3	4b	3.86	6
2	2b	4.12	4
1	1b	4.36*	
1	1b	4.54*	
3	4f	4.54	2
1	1b	4.73*	
1	1b	4.95*	
2	2f	5.08	2
1	1b	5.19*	
4	3f	5.52	9
4	2f	6.27*	7
3	3f	6.86*	4
1	2b	7.00	
2	1f	7.15*	2
2	3f	7.48	4
3	2f	7.65	2
2	1f	8.02	2
3	4f	8.26	4
1	1b	8.49	
2	2b	8.74	4
4	3b	9.23	2
1	1b	9.52*	
3	3f	9.73	6
1	1b	9.92*	
1	2b	4590.16	
3	4b	0.51	2
2	2f	0.90	6
3	2f	1.11	2
2	3f	1.40*	2
1	2b	1.57	
2	2b	1.74*	1
2	2f	2.10*	1
1	1b	2.30‡	
2	7f	2.30	2
1	2b	2.47*	
1	1b	2.57‡	
1	1b	2.76‡	
2	3f	3.00*	1
1	5f	3.12	
1	1b	3.20‡	
1	1b	3.58*	
4	4b	3.78	3
1	1b	4.18*	
1	1b	4.30	
1	1b	4.40*	
4	3m	4.63	3
1	1b	4.97	*
1	1b	5.25*	
2	4f	5.38	2
2	2f	5.52*	3
1	1b	5.76	
4	4f	6.05	5
2	2b	6.40	4
1	1b	6.71*	
1	4b	6.90	
3	3f	7.04*	1
1	2b	7.31*	
3	3f	7.51	3
1	2b	7.60*	
1	1b	7.92*	
1	1b	8.20*	
3	4f	4598.33	3
1	1b	8.47*	
2	1m	8.71*	2
2	4f	9.05	6
1	2b	9.06‡	
1	5b	9.26*	
1	1b	9.40‡	
4	3f	9.63	4
1	1b	9.98	
4	3s	4600.25	2
1	1b	0.55*	
3	3f	0.88*	1
1	5f	0.93	
3	2f	1.23*	2
1	1b	1.54*	
2	4f	1.70	2
2	2b	1.82*	2
1	1f	2.09	
4	2m	2.32	3
1	1b	2.51	
1	1b	2.75*	
3	2m	2.87	3
1	1b	2.93*	
1	1b	3.16*	
1	2f	3.28	
1	1b	3.38*	
1	1b	3.59*	
2	7f	3.66	6
1	1b	3.77‡	
1	2f	3.85*	
1	1f	3.96‡	
3	3m	4.25*	3
1	8s	4.41	
1	1b	4.43‡	
2	4m	4.69*	2
1	1b	4.92‡	
1	1f	5.14*	
3	2m	5.20	5
1	1b	5.40*	
1	1b	5.58*	
3	4f	5.87	6
1	1b	5.93*	
2	2f	6.50*	4
3	6m	6.68	1
1	2f	6.83*	
2	2b	7.05*	4
1	2b	7.29‡	
2	4f	7.46	2
1	2f	7.53*	
1	1b	7.68‡	
4	3f	8.11	1
2	2b	8.48	4
1	1f	8.65*	
1	2b	8.78*	
2	4f	8.79	3
2	1b	8.94*	2
1	2b	9.16*	
3	4f	9.43	5
1	1b	9.45*	
1	1b	9.67*	
4	3f	4610.21	3
1	1b	0.61	
4	4b	0.82	2
3	2b	1.21	1
3	3f	1.57	4
2	1b	1.72*	2
2	3b	2.14*	2
2	4m	2.23	2
2	2b	2.56*	4
1	1b	2.80	
1	1b	3.04*	
3	2b	3.14	4
1	1b	3.41*	
2	2b	3.67	3
1	1b	3.92*	
2	5f	4.06	2
2	2f	4.18*	2
1	1b	4.47	
3	2f	4.81	4
2	1b	5.16‡	2
1	3b	5.27*	
2	1b	5.44‡	10
1	6b	5.46	
1?	1b	5.75*	
1	1b	5.89*	
2	3b	5.98	2
2	2f	6.10*	4
3	2f	6.50*	0
1	6f	6.65	
1	1b	6.79‡	
1	3f	6.92*	
2	1b	7.10‡	5
1	1b	7.33	
2	2b	7.65*	5
2	2f	7.81	1
1	1b	7.98*	
3	2b	8.31	6
1	1b	8.54	
3	2f	8.79	0
1	1b	9.01	
3	2b	9.21	3
1	1b	9.50	
4	2f	9.74	2
3	2m	4620.22*	2
1	2f	0.37	
1	1b	0.47*	
2	2b	0.64	2
1	1b	0.99*	
3	2f	1.11	4
1	1b	1.31*	
1	1b	1.60	
4	3f	1.85	1
1	1b	2.29	
2	2b	2.53	1
1	1b	2.91*	
1	4f	3.07	
2	2b	3.28*	8
1	1b	3.62*	
1	4f	4623.82	
2	2b	3.99*	1
4	2f	4.44	2
3	3f	4.88	2
3	3f	5.19	7
4	4m	5.82	2
2	2f	6.30*	0
2	6m	6.48	2
1	1f	6.64*	
2	1f	6.88	1
1	1b	7.08	
1	1f	7.31	
2	2b	7.52*	3
2	5s	7.95	4
2	2m	7.98*	6
1	1b	8.31*	
2	2b	8.48*	1
2	2f	8.74*	1
1	6m	8.84	
1	1b	8.91‡	
1	2f	9.01*	
2	2f	9.18‡	2
1	1b	9.37	
4	4s	9.69	2
2	1f	4630.04*	2
2	3m	0.40*	3
2	4m	0.46	2
1	1f	0.64*	
2	1f	0.94*	1
2	3f	1.09	0
2	1f	1.20*	2
1	1b	1.45*	
1	1b	1.63‡	
2	6m	1.66	1
1	2f	1.78*	
1	1b	1.93‡	
1	1f	2.11*	
1	1f	2.31*	
3	4m	2.37	2
1	1f	2.52*	
1	1f	2.72*	
3	2m	2.92	2
1	2b	2.92*	
1	1b	3.11*	
3	2f	3.36*	4
1	1b	3.58*	
1	8f	3.60	
3	2f	3.83*	4
1	1b	3.99	
1	1b	4.18	
1	1b	4.34*	
3	4f	4.50	3
1	2b	4.65*	
3	2b	4.99	2
2	2b	5.19	3
4	2f	5.48	2
4	3b	5.87	3
4	2f	6.32	2
1	1f	6.57	
4	3f	6.84	2
1	1b	7.03	
1	2b	7.22*	
1	7f	7.43	
3	2f	7.54*	1
1	1b	7.82*	
1	1b	8.09*	
3	5f	8.17	3
1	1b	8.34*	
1	1b	8.53	
4	2b	8.77	3
1	2b	9.06*	
3	3f	9.21	3
1	1f	9.30*	
2	2b	9.59	2
2	1f	9.77	5
1	1b	4640.00	
4	3f	0.21	2
1	1b	0.53*	
1	2b	0.66	
2	1b	0.75*	2
2	1b	1.05*	3
1	6b	1.30	
2	2b	1.36*	4
2	3b	1.59*	4
3	2b	1.84	4
2	2b	2.19*	2
1	3b	2.41	
3	2f	2.56*	4
1	1b	2.88	
4	1f	3.06	4
1	1b	3.26	
4	3f	3.56	3
2	1f	3.88	1
1	1b	4.13	
1	2f	4.36	2
1	1b	4.54*	
2	1b	4.68*	2
1	5f	4.81	
3	2f	4.98*	4
1	2b	5.32*	
3	3f	5.52	2
1	1b	5.67*	
1	1b	5.80*	
1	1b	5.96	
4	3m	6.16	2
4	3m	6.67	3
4	4m	7.14	6
4	2b	7.60	3
4	2f	8.06	2
1	1b	8.33*	
2	2f	8.46	2
1	1b	8.55*	
1	2f	8.66‡	
1	1b	8.78*	
1	1b	9.03*	
3	4b	9.10	3
1	1b	9.31*	
1	1b	9.61*	
3	3f	4649.81	1
1	2b	9.91*	
1	1b	4650.18	
4	2f	0.45	3
1	1b	0.74*	
1	1b	1.05*	
2	4f	1.12	5
1	1b	1.46*	
4	2b	1.72	4
1	2b	2.09*	
2	2f	2.26	4
1	1b	2.37*	
1	1b	2.62	
3	2b	2.84	3
1	1b	3.11*	
2	2f	3.40	1
1	1b	3.57*	
3	2f	4.02	5
2	3f	4.72	2
3	2b	5.16	2
1	1b	5.48*	
2	3f	5.70	8
1	1b	5.91*	
2	4b	6.43	3
2	4b	7.12	1
2	4f	7.86	6
2	2b	8.60	6
1	2b	8.98*	
1	5f	9.35	
1	2b	9.53*	
3	4f	4660.21	8
3	2f	0.81	8
1	3b	1.42*	
2	5f	1.62	4
1	2b	1.97*	
1	1b	2.34*	
3	6f	2.63	4
1	2b	2.77*	
2	1f	3.13‡	1
1	1b	3.25*	
2	3f	3.50‡	4
1	6f	3.62	
1	1f	3.79*	
1	1b	4.07*	
3	3f	4.22	3
1	1b	4.40*	
1	1b	4.65*	
1	3f	4.78	
3	1b	4.97*	6
1	1f	5.20*	
1	3b	5.30	
3	3f	5.41*	1
1	2b	5.68	
4	3f	6.12	2
1	1b	6.47*	
3	4f	6.65	2
1	2b	6.73*	
3	2f	7.09*	1
1	3b	7.29	
2	1f	7.43*	1
3	4f	7.79	5
1	1f	8.08	
4	3f	8.41	3
4	2f	8.92	1
3	2f	9.29	2
1	1b	9.61*	
1	1b	9.81*	
1	1b	4670.00*	
3	3m	0.15	3
1	1f	0.18*	
1	1b	0.38*	
3	1f	0.57	0
1	1f	0.82*	
1	1b	0.98	
1	1b	1.09*	
4	4f	1.36	2
4	2f	1.90	4
4	2f	2.32	4
1	1b	2.70*	
3	2f	2.79	1
1	1b	2.95*	
3	2b	3.28	4
1	1f	3.44	
3	3f	3.83	5
1	1b	3.97*	
1	1b	4.18	
4	2b	4.48	4
1	1b	4.82*	
3	5m	5.00	0
1	1b	5.07*	
1	1b	5.30	
1	1b	5.58	
4	3f	5.86	5
1	1b	6.15	
4	2f	6.56	5
2	2f	7.14*	4
2	6m	7.32	4
2	2f	7.44*	1
4	2f	7.83	2
1	1b	8.18	
3	2b	8.44	3
1	1b	8.68*	
1	5f	8.92	
3	2b	9.03*	4
4	2f	9.46	2
2	2f	9.84	2
1	1b	4680.05*	
2	4f	0.19	4
2	2f	0.28*	1
1	1b	0.49	
4	3f	0.81	3
1	1b	1.05	
4	2f	1.37	2
3	2f	1.79*	2
1	7m	1.99	
3	2f	2.18*	4
1	1b	4682.40	
1	1b	2.69	
2	2b	2.98*	1
1	2b	3.10	
1	1b	3.23*	
2	2b	3.46	2
1	1b	3.74*	
2	2f	3.95	3
1	2b	4.08*	
1	1b	4.30	
1	2b	4.60*	
2	3f	4.72	4
1	1b	4.81*	
2	1b	5.10	6
1	1b	5.35	
3	3b	5.55	3
1	2b	6.02*	
2	6f	6.27	0
1	2b	6.29*	
1	1b	6.54*	
1	2b	6.88*	
2	6f	7.04	1
1	1b	7.17*	
1	4f	7.75	
2	2b	7.91*	1
1	2b	8.01‡	
1	1b	8.12*	
1	1b	8.35*	
3	2b	8.58*	1
1	4b	8.64	
3	2b	8.94*	5
2	2f	9.29*	1
2	2f	9.36	2
1	1b	9.61*	
4	3f	9.92	1
1	2b	4690.23	
2	2b	0.47	1
1	1b	0.68*	
1	5m	0.90	
3	3f	1.04*	3
2	1b	1.42	6
1	1b	1.72	
1	1b	1.91	
3	3b	2.10	1
1	1b	2.35	
2	2b	2.66	6
2	2b	2.86	4
2	2b	3.18*	3
1	6f	3.57	
2	2f	3.58*	1
1	1b	3.83*	
1	1b	4.04	
2	2b	4.23*	3
2	2b	4.52*	1
1	3b	4.58	
1	1b	4.80*	
2	3b	5.03*	1
1	1b	5.30*	
1	5b	5.37	
2	2b	5.57*	1
3	3b	6.01	3
2	2b	6.34	1
1	1b	6.52	
3	4b	6.88	4
1	1b	7.15*	
1	2b	7.47*	
2	3f	7.55	6
1	2b	7.73*	
1	1b	7.94*	
1	1f	8.22*	
2	4f	8.26	8
1	1b	8.45*	
1	1b	8.79	
1	1b	9.05*	
2	4b	9.19	5
1	1b	9.37*	
3	2b	9.75	2
1	1b	4700.03*	
2	4b	0.30	4
2	2b	0.36*	2
1	1b	0.57	
3	2f	0.80	3
3	2f	1.21	4
1	1b	1.54*	
1	1b	1.83*	
2	3f	1.90	2
1	1b	2.03*	
1	1b	2.25*	
1	3f	2.45	
2	1f	2.53*	2
1	1b	2.75*	
1	1b	3.00*	
1	3m	3.21	
1	1b	3.22‡	
1	3f	3.36*	
1	1b	3.65‡	
3	2f	3.98	2
2	1b	4.40	4
2	2b	4.54	4
1	1b	4.83*	
2	3b	5.02	2
1	1b	5.19*	
2	2b	5.44*	3
2	2b	5.93*	3
1	1b	6.19*	
1	1b	6.40*	
1	4b	6.44	
2	2f	6.63*	1
1	1b	6.83	
2	2b	7.12*	2
1	4b	7.21	
1	1b	7.28*	
2	2b	7.47*	5
2	2b	7.76*	2
1	4b	8.03	
1	1b	8.09‡	

N	I	λ	d
1	4f	4708.24*	
1	1b	8.41#	
1	1b	8.67*	
2	2b	8.86	8
1	1b	9.14*	
3	2b	9.50	4
1	1b	9.85	
2	2b	4710.13	1
2	3b	0.28	3
2	2f	0.91	7
2	2b	1.48	4
1	1b	1.99*	
1	3f	2.16	
2	2b	2.30*	2
1	2b	2.65*	
1	4b	2.94	
2	2b	3.05*	3
1	2b	3.44*	
1	3f	3.58	
1	1b	3.70*	
1	1b	3.96*	
1	1b	4.32*	
2	4b	4.35	7
1	1b	4.57*	
2	1b	4.80	4
1	1b	5.11*	
2	4b	5.26	2
1	1b	5.45*	
1	1b	5.82*	
2	4f	5.96	0
1	1b	6.07*	
1	2b	6.35*	
1	1b	6.60*	
1	4b	6.68	
2	2b	6.80*	1
1	1b	6.98	
3	3b	7.35	1
2	1b	7.74*	2
1	2b	8.06*	
1	4f	8.11	
1	4f	8.22#	
1	1b	8.30*	
1	1f	8.52*	
3	2f	8.80	2
2	2b	9.19	5
2	2f	9.46	4
1	1b	9.69	
3	3b	4720.02	3
1	1b	0.30*	
1	5f	0.39	
2	2b	0.57*	2
1	1b	1.03*	
2	4f	1.15	1
1	1b	1.27*	
1	1b	1.52	
1	2b	1.76*	
2	6f	1.96	1
1	1b	2.02*	
1	1b	2.31*	
1	1b	2.53*	
2	5f	2.74	2
1	1b	2.77*	
1	1b	3.07*	
2	2f	3.36	2
2	3b	3.58	1
1	1b	3.79	
2	2b	4.08*	6
1	5b	4.37	
2	2b	4.68*	3
1	2b	4.89*	
1	7f	5.24	
1	1b	5.26*	
2	2b	5.46*	4
1	1b	5.74*	
2	2f	6.17*	0
1	3f	6.31	
1	1b	6.56*	
2	1f	6.79*	2
2	3f	7.23*	0
1	9f	7.42	
2	3f	7.72*	4
1	2b	8.10	
2	2f	8.35	3
1	1b	8.70*	
1	3f	8.80	
2	4f	8.98*	1
1	1b	9.24*	
2	2b	9.47	3
1	1b	9.70*	
2	2f	4730.12	0
1	1b	0.31*	
1	1b	0.52	
1	1b	0.71*	
2	4f	0.90	4
1	1b	1.06*	
1	2b	1.37	
2	2f	1.67	3
3	4f	2.01	7
1	1b	2.29	
3	3b	2.56	8
1	1b	2.79	
1	2b	3.10	
2	2f	3.44*	1
1	3f	3.56	
1	1b	3.69*	
3	3f	4.01	2
1	1b	4.40	
3	3b	4.64	3
1	2b	4.92	
1	1b	5.13	
1	1b	5.32	
4	5m	5.56	2
2	1f	6.05*	1
1	1f	6.33#	
1	4m	6.34	
2	2f	6.46*	0
1	1b	6.63#	
1	1b	6.78	
4	2f	6.98	2
2	1b	4737.22	1
1	1b	7.41	
4	3b	7.64	3
4	2m	8.04	1
4	2f	8.48	3
1	1f	8.69	
1	1f	8.84#	
2	4b	8.96*	0
1	4f	9.06	
1	1f	9.06#	
1	2b	9.27*	
1	1f	9.42	
4	3f	9.58	1
1	1b	9.79	
1	1f	4740.00*	
2	3f	0.22*	2
2	6f	0.25	6
2	2f	0.50*	0
1	1f	0.77	
4	3m	1.01	3
1	1f	1.39	
1	1b	1.60*	
3	3f	1.71	2
1	1b	1.79*	
1	1b	2.00*	
1	1b	2.18*	
3	3b	2.27	2
1	1b	2.41*	
3	3b	2.70*	0
1	5b	2.90	
1	1b	2.99#	
2	2b	3.11*	1
1	1b	3.21#	
1	1b	3.42	
4	3f	3.66	2
1	1b	3.99	
2	2f	4.27	0
1	1b	4.53	
2	2f	4.68*	4
2	9f	4.80	4
1	1b	4.93*	
1	2f	5.15	
2	2f	5.43	2
1	1f	5.67	
4	3s	5.96	2
4	3m	6.54	5
1	1f	6.81#	
1	2f	6.98*	
2	7f	7.23	8
1	1b	7.25#	
2	2f	7.54*	1
1	2b	7.87	
1	1b	8.13	
3	2f	8.41	5
1	1b	8.92*	
2	5b	9.04	2
1	1b	9.09*	
1	1b	9.28*	
2	2b	9.48	1
1	1b	9.71	
1	1b	9.94*	
2	4f	4750.06	2
1	2b	0.22*	
1	1b	0.49	
1	1b	0.69*	
2	3f	0.85	4
1	1b	0.92*	
1	1b	1.12*	
3	3f	1.45	5
1	2b	1.64	
1	2b	2.01	
2	2b	2.32	0
3	3b	2.78	4
1	2b	3.03	
3	3f	3.35	2
1	1b	3.54	
3	2b	3.89	2
1	1b	4.14	
1	1b	4.44	
1	1b	4.69*	
2	6f	4.88	2
1	1b	4.98*	
1	2b	5.35	
1	2b	5.74*	
2	6f	5.92	4
1	2b	6.12*	
1	2b	6.39	
3	2f	6.84	3
1	1b	7.15	
3	2b	7.34	2
1	2b	7.58*	
2	2b	7.78	4
1	1b	7.92*	
3	2b	8.19	2
1	1b	8.44*	
1	1b	8.74*	
2	4f	8.80	2
1	1b	9.20*	
2	2b	9.38	5
1	1b	9.65*	
2	2f	9.78	1
1	2b	9.89*	
2	1b	4760.21	1
1	1b	0.74	5
1	2b	1.13	
3	2f	1.47	3
1	2b	1.82#	
1	1b	1.96*	
1	1b	2.11#	
1	4f	2.17	
2	2b	2.34*	2
3	2b	2.78	3
1	1b	2.92	
3	3f	3.31	4
1	1b	3.69	
3	3f	3.92	3
2	1b	4.40*	4
1	3b	4.52	
2	1b	4764.76*	4
1	1b	5.02*	
1	1b	5.26*	
1	5f	5.34	
3	2b	5.54*	2
2	5f	6.06	2
1	1b	6.13*	
1	1b	6.24*	
1	1b	6.52	
2	3b	6.98	1
2	2b	7.36	2
1	2b	7.72	
3	3m	8.08	4
1	2f	8.40	
3	3f	8.77	5
1	1b	8.96	
2	2f	9.22	1
2	2f	9.57	0
1	3b	9.94	
1	2b	4770.23	
2	3b	0.50	2
2	3f	0.85*	
1	4f	1.05	
1	4f	1.24*	
1	1b	1.63*	
1	4b	1.71	
1	1b	1.83*	
3	3b	2.12	3
3	3f	2.55	5
2	3b	2.88	6
3	2b	3.25	7
1	2b	3.50	
2	2b	3.76	2
2	2b	4.02	1
2	2b	4.22	2
2	2b	4.46	4
2	2b	4.70	5
2	2f	4.92*	4
1	5f	5.10	
1	1b	5.20#	
1	3f	5.31*	
1	1b	5.41#	
3	3b	5.64	2
1	5b	5.94	4
1	2f	6.44	5
2	2b	6.69	2
2	4b	6.96	2
3	4f	7.25	2
2	2f	7.60	8
1	4f	8.01*	
1	5b	8.18	
1	2b	8.30*	
2	2b	8.73*	5
1	5b	8.92	
1	2b	8.94*	
2	3b	9.19*	1
1	3f	9.53*	
1	7b	9.72	
1	3f	9.89*	
2	3f	4780.44	6
1	3f	0.67	
3	3f	1.14	7
2	2b	1.46*	4
1	3b	1.81*	
1	7f	1.84	
1	2f	2.16*	
1	3f	2.50*	
1	8f	2.91	
1	3f	2.92*	
2	2b	3.30*	1
3	2f	3.65	5
1	3b	3.88	
3	2f	4.12	3
2	2b	4.32	1
1	1b	4.51*	
1	2b	4.61	
1	1b	4.69*	
2	4b	4.86	2
1	3f	5.15	
2	3f	5.70	2
1	2f	6.00	
1	3b	6.21*	
1	6f	6.42	
1	2f	6.58*	
1	3f	6.86	
1	3f	7.25*	
1	7b	7.38	
1	3f	7.61*	
2	3m	8.04	3
1	2b	8.47	
2	2b	8.84	4
1	3b	9.09	
2	2b	9.61	3
1	3f	9.96	
1	2b	4790.28	
2	2f	0.60	1
1	2b	0.87*	
1	2b	1.02*	
1	6b	1.08	
2	2b	1.17*	2
2	2b	1.41*	3
1	1b	1.61	
2	2b	1.75	2
1	1b	1.94*	
1	1b	1.92	
2	2b	2.16	4
1	2b	2.51*	
1	3f	2.89	
1	2b	3.28*	
2	4b	3.69	1
1	2b	4.34	
2	2b	4.70	9
2	2b	5.42	6
2	2f	5.97	4
1	2b	6.36*	
1	3b	6.88	
1	3b	7.02*	
2	2b	4796.08	1
3	3f	6.42	8
2	3f	6.97	2
2	2f	7.30*	1
1	8b	7.46	
2	3f	7.70*	2
2	3f	8.12	2
2	3f	8.50*	8
1	7f	8.76	
2	2f	8.90*	4
2	2f	9.25	1
1	1b	9.43	
1	1b	9.61*	
2	4f	9.70	8
1	1f	9.87*	
3	4f	4800.27	4
2	3f	0.66	4
1	1b	0.93*	
2	5f	1.21	1
1	1b	1.40*	
2	2f	1.73	10
3	3f	2.11	4
1	1b	2.33*	
1	2f	2.59	
2	2f	2.81*	1
2	2f	3.06	10
2	2f	3.39*	1
1	5f	3.55	
1	1b	3.66*	
2	2f	3.84	6
3	3f	4.37	4
2	2f	4.61	1
1	1b	4.81	
3	4m	5.02	3
2	3f	5.44	2
2	3f	5.68	1
2	2f	6.00	5
3	3f	6.34	5
2	2b	6.67	11
2	3f	6.90	1
2	2b	7.24*	1
1	4b	7.46	
2	2b	7.68*	2
1	3b	8.08*	
1	5b	8.25	
1	2f	8.54*	
3	3f	8.94	5
1	1b	9.23	
2	3f	9.45	3
2	2b	9.76*	1
1	4b	9.87	
1	3f	4810.03*	
2	3f	0.44	6
2	3b	0.63*	3
1	3b	0.87	
1	1b	1.04*	
3	2f	1.32	8
2	3b	1.66	4
1	2b	1.91*	
1	5m	2.01	
2	3b	2.20*	4
2	2b	2.46	2
3	4m	2.71	2
2	2f	3.04	2
2	2f	3.32*	2
1	4b	3.42	
1	1b	3.50*	
2	2f	3.72	2
2	3b	3.92	4
2	2f	4.20*	4
1	3b	4.28	
2	2f	4.42*	1
1	1b	4.66*	
1	4b	4.78	
2	2b	4.96*	2
2	2f	5.18	4
2	2f	5.54*	4
1	3f	5.72	
2	3f	5.88*	3
3	2f	6.22	3
3	3f	6.61	6
2	3f	6.86	4
1	2b	7.24*	
2	4f	7.42	5
1	1b	7.45*	
1	1b	7.67*	
1	1b	7.84#	
1	4f	7.94*	
1	2b	8.08#	
1	9f	8.27	
2	2b	8.40*	2
1	1b	8.74	
3	3b	9.01	3
1	1b	9.40	
3	2f	9.70	3
1	1b	9.95*	
1	2b	4820.09	
1	1b	0.20*	
1	1b	0.39*	
1	4f	0.54	
1	1f	0.66*	
2	2b	0.90	6
2	2b	1.18*	2
1	5b	1.39	
2	3b	1.55*	0
1	1b	1.92	
2	2b	2.16	4
1	2b	2.51*	
1	3f	2.89	
1	2b	3.28*	
2	4b	3.69	1
1	2b	4.34	
2	2b	4.70	9
2	2b	5.42	6
2	2f	5.97	4
1	2b	6.36*	
1	3b	6.88	
1	3b	7.02*	
2	2f	4827.48	4
1	2b	8.11*	
1	3f	8.53	
1	2b	8.83*	
2	3f	9.26	2
1	2b	9.66*	
1	3b	4830.02	
1	2b	0.27*	
2	2f	0.68	2
1	2f	1.04	
2	2f	1.46	4
1	2b	1.75	
2	3f	2.33	5
2	2f	2.98	2
1	2b	3.43*	
1	4m	3.78	
1	3f	4.05*	
2	3f	4.49	2
2	3b	5.08	6
2	3f	5.59	7
2	2f	6.14	4
1	2b	6.56	
2	3f	6.93	2
1	2b	7.41	
2	2f	7.78	1
1	2b	8.20*	
2	4f	8.59	
1	3f	8.75*	
1	3b	9.17*	
1	7b	9.40	
1	2b	9.44*	
1	3b	9.93*	
2	2b	4840.34	2
1	3b	0.69	
2	2b	1.08	6
1	2b	1.50*	
1	3b	1.75	
1	2b	1.86*	
1	3f	2.21	
1	2b	2.49*	
1	3b	2.60	
1	2b	2.94*	
2	2b	3.28	2
1	2b	3.66	
2	3f	4.03	4
1	2b	4.40	
1	3b	4.78*	
1	3f	4.90	
1	2b	5.24*	
2	2f	5.60	2
1	2b	6.05	
2	4f	6.38	3
1	2b	6.79	
1	2b	7.02#	
1	3f	7.21*	
1	1b	7.34#	
1	3f	7.37	
1	1f	7.68*	1
1	1b	7.83	
3	3f	8.01	1
2	3f	8.38	2
2	2b	8.65*	
2	4f	8.81	5
1	2b	8.96*	
2	1f	9.18	4
1	2b	9.50*	2
1	6m	9.70	
1	2b	9.72*	
2	2f	4850.00*	2
2	2b	0.32*	6
1	8m	0.46	
1	2b	0.61*	8
2	2b	1.00*	3
2	2f	1.28*	2
1	3f	1.43	
1	1b	1.57*	
1	1b	1.89*	
1	3f	2.01	
2	2f	2.15*	2
2	2b	2.51	4
2	2b	2.85*	11
1	3f	2.98	
2	2b	3.32*	4
2	2f	3.71	3
2	4f	4.31	1
1	2f	4.78	
3	2f	5.30	6
2	2f	5.64	5
1	2b	5.80	
1	1b	6.02*	
2	4m	6.18	6
1	2b	6.28*	
2	2f	6.90	8
1	2b	7.19*	
1	3f	7.31	
1	2b	7.54*	
2	2f	7.74*	6
1	3m	7.90	
2	2f	8.04*	4
1	1b	8.33*	
1	2b	8.49*	
2	2f	8.54	6
1	1b	8.74*	
2	2f	8.94	0
3	4f	9.22	3
2	2f	9.52	2
3	3f	4860.04	4
1	1b	0.25	
2	2f	0.54*	1
1	1b	0.80*	
1	3f	0.89	
2	2f	1.04*	2
1	2b	1.25	
3	3f	1.55	4
1	2f	2.05*	
1	3f	2.23	
1	2f	2.38*	
1	2b	2.70	
2	4f	4863.06	4
1	2b	3.44	
1	3b	3.82	
2	4f	3.92	1
2	4f	4.64	4
1	2b	4.83	
1	2b	5.14*	
1	4b	5.55*	
1	7f	5.56	
1	2b	5.93*	
2	4b	6.46	1
1	1b	6.81	
2	2f	7.18	4
1	2b	7.53	
2	3f	7.91	0
1	2b	8.42*	
1	4f	8.71	
1	3b	9.00*	
2	4b	9.52	2
1	4b	4870.00	
2	2b	0.42	2
1	2b	0.75	
2	4b	1.12	1
1	2b	1.51	
2	3f	1.89	2
1	2b	2.32	
1	2b	2.74	2
1	3b	3.12*	
1	3f	3.34	
1	2b	3.58*	
1	2b	3.92*	
1	3f	4.11	
1	3b	4.24*	
1	2b	4.59*	
1	2b	4.74	
1	4b	4.97*	
2	3f	5.27	5
1	2f	5.65	
2	2b	5.94	2
1	2b	6.32*	
1	5b	6.54	
1	3b	6.67*	
1	2f	7.07	
3	3f	7.49	3
1	3b	7.79*	
2	2b	7.94	4
1	3b	8.06*	
2	2f	8.30	2
3	4f	8.62	3
2	2f	9.10	5
1	2b	9.37*	
2	3f	9.72*	2
1	7f	9.85	
2	3f	4880.10*	6
3	3f	0.50	0
1	4m	1.14	4
3	2f	1.66	6
2	2f	2.05*	5
1	4f	2.19	
2	2f	2.33*	6
2	3f	2.66*	6
1	1b	2.91*	
1	8f	2.94	
2	2f	3.16*	1
1	1b	3.36*	
1	3f	3.46	
2	2f	3.63*	0
2	2f	3.93	6
2	2f	4.16*	2
1	6m	4.27	
1	1f	4.41*	
2	2f	4.57*	3
1	3f	4.80	
2	2f	4.96*	6
2	2f	5.32*	4
1	5f	5.49	
2	3f	5.62*	2
2	2f	5.86	6
3	4m	6.37	5
1	1b	6.63	
2	2f	6.80	2
2	2b	7.08*	0
1	4f	7.16	
2	2f	7.34*	4
2	2f	7.69*	3
1	6s	7.83	
2	3f	7.98*	4
2	2f	8.26	2
2	2f	8.52*	1
1	4f	8.68	
2	2f	8.82*	5
1	1b	9.02	
3	3m	9.20	1
2	2f	9.48	4
3	3f	9.80	4
1	1b	4890.05	
2	2f	0.22*	2
1	3m	0.54	
2	2f	0.63*	2
2	2f	0.97*	3
1	1b	1.17	
3	2f	1.41	3
3	3f	1.83	4
1	1b	2.03*	
1	3b	2.24	
1	2b	2.36*	
1	4f	2.59	1
3	2b	3.11	5
2	2b	3.46	2
2	3f	3.91*	1
1	8f	4.09	
1	1b	4.16*	
2	2b	4.42*	2
1	2f	4.85*	
1	8b	5.06	
1	2b	5.20*	

N	I	λ	d
1	2b	4895.48	
2	2b	5.86	1
2	2b	6.31*	8
1	8f	6.56	
2	2f	6.66*	3
1	3b	7.08*	
1	2f	7.47*	
1	4f	7.69	
1	2b	7.86*	
1	2b	8.13	
2	2b	8.42	2
1	3b	9.00*	
1	3f	9.19	
1	2b	9.38*	
1	3f	9.61	
1	2b	9.90*	
1	6b	4900.01	
1	3f	0.46*	
1	2b	0.72	
2	4m	1.06	6
1	2f	1.51*	
1	1f	1.67	
1	1f	1.87*	
2	4m	2.27	2
2	4m	2.96	2
1	1f	3.33	
1	2f	3.65	
2	4f	3.96	4
1	3b	4.37	
2	4b	4.73	5
1	3b	5.07	
2	4b	5.56	1
1	2b	5.92	
1	4b	6.26	
2	2b	6.68	8
2	3b	7.21	2
1	2b	7.67	
2	2b	8.30	8
2	2b	8.86	3
1	2b	9.32*	
1	2f	9.66	
1	1b	9.80*	
1	3b	4910.29*	
1	3f	0.56	
1	3b	0.81*	
1	2b	1.24*	
1	6b	1.47	
1	3b	1.68*	
2	2b	2.05	1
2	2b	2.70	3
2	2b	3.24	16
2	3b	3.77	7
1	2b	4.27	
2	2b	4.56	4
1	1b	4.91	
2	2b	5.25	1
1	2b	5.50	
2	2b	5.76	3
2	3f	6.18	4
1	3b	6.60	
2	2f	6.96	2
1	2b	7.30*	
1	1f	7.49	
1	1b	7.66*	
2	3f	7.94	1
1	2b	8.20	
1	2b	8.43	
2	2f	8.72	2
1	2b	9.18*	
1	2f	9.43	
1	2b	9.58*	
1	2b	9.91	
2	4b	4920.27	0
2	3b	0.90	10
2	2b	1.36	6
1	2b	1.70	
2	2f	2.03	6
2	3f	2.70	0
1	2b	2.95	
2	3f	3.42	8
1	2b	3.86	
2	2b	4.26	2
1	2b	4.61*	
1	4f	5.10	
1	3b	5.37*	
2	2f	5.87	8
1	1f	6.32*	
1	3b	6.53	
1	5f	6.70*	
2	2f	7.16	8
2	4f	7.78	10
1	2b	8.21	
2	4f	8.50	2
1	2b	8.94*	
1	4f	9.25	
1	3b	9.42*	
2	3f	4930.02	2
1	3b	0.26	
1	2b	0.70*	
1	6f	0.98	
1	2b	1.24*	
2	4m	1.78	4
1	2b	2.11	
2	4f	2.43	5
1	1b	2.83	
2	4m	3.25	3
1	2b	3.67*	
1	2f	4.01	
1	2b	4.24*	
2	5f	4.72	6
2	2f	5.32	2
2	4f	5.90	7
1	3f	6.52*	
1	5f	6.67	
1	2f	6.99*	
1	2b	7.36*	
1	6f	7.49	
1	2b	7.67*	

N	I	λ	d
2	3b	4938.18	4
1	3b	8.81*	
1	3f	9.19	
1	2b	9.31*	
1	2b	9.83*	
1	4f	4940.01	
1	2b	0.26*	
2	4f	0.71	2
1	3b	1.53	
1	2f	2.06*	
1	2f	2.36	
1	2f	2.51*	
2	6f	2.90	1
1	2b	3.25	
2	3f	3.94	2
1	3b	4.50*	
1	3f	4.88	
1	3b	5.05*	
1	2b	5.45*	
1	4f	5.69	
1	1b	6.04*	
2	4f	6.46	4
2	8f	7.14	8
2	4f	7.82	1
1	2f	8.25	
2	5f	8.80	8
1	2f	9.12	
2	2b	9.72	6
1	2b	4950.26	
2	4b	0.56	2
1	2b	0.97*	
1	1f	1.10	
1	2b	1.45*	
2	2f	1.73	5
1	2b	2.10*	
1	3m	2.39	
1	3f	2.55*	
1	2b	2.89*	
1	4f	3.05	
1	3b	3.26*	
2	4m	3.84	6
1	2b	4.30	
2	4m	4.75	1
1	2b	5.09	
2	2f	5.56	4
1	2b	6.02*	
1	7b	6.32	
1	2b	6.62*	
1	2b	7.10*	
1	2b	7.48*	
1	5b	7.49	
1	2b	7.81*	
2	2b	8.24*	8
1	1b	8.76*	
1	5m	8.84	
1	3f	9.09*	
1	2b	9.51	
2	2f	9.88	4
1	2b	4960.37*	
1	3f	0.53	
1	2b	0.73*	
1	2f	1.11*	
1	4m	1.35	
1	3f	1.57*	
2	3f	2.15	3
2	2b	2.80	8
1	3b	3.41*	
1	8b	3.81	
1	2f	3.88*	
1	1b	4.28*	
1	3f	4.72*	
1	10f	4.86	
1	3f	5.27*	
2	5f	5.82	10
2	3f	6.43	3
1	2f	6.82*	
1	8m	7.14	
1	3f	7.20*	
1	2b	7.49*	
1	3f	8.06	
2	3b	8.29	2
1	3b	8.79	
1	2b	9.25*	
1	2b	9.51*	
1	5f	9.57	
1	2b	4970.02*	
2	2f	0.46	4
1	2b	0.86	
1	3b	1.26*	
1	5b	1.42	
1	3b	1.77*	
2	3b	2.30	6
1	3b	2.62	
2	3b	3.02	1
2	2f	3.47	3
2	3f	3.78*	2
1	3b	4.22	
2	2m	4.41*	5
2	3b	4.75*	0
1	2f	4.98	
1	3b	5.09*	
2	2f	5.40*	1
1	6f	5.59	
2	2b	5.80*	1
2	2f	6.16*	7
1	4f	6.30	
2	3f	6.65*	2
1	3b	7.07*	
2	4f	7.28	6
1	2b	7.52*	
3	3f	8.06	8
2	2b	8.56*	1
1	5f	8.93	
2	3f	9.01*	4
3	4f	9.56	4
2	2f	4980.04*	2
1	5f	0.44	
2	2f	0.56*	10

N	I	λ	d
3	2f	4981.00	11
3	3f	1.37	4
2	2b	1.94	1
3	3f	2.45	9
1	2b	2.85	
2	3f	3.20	2
2	2f	3.58	8
2	2f	3.85*	6
1	4b	4.05	
2	2m	4.39*	4
3	3b	4.95	7
1	3b	5.35*	
2	4b	5.60	4
1	2b	5.76*	
1	2b	6.17*	
1	3b	6.33	
1	2b	6.63*	
3	4b	7.07	3
2	3f	7.58	6
3	3b	8.03	6
2	4f	8.52	6
3	2b	8.89	9
3	3f	9.34	4
3	3f	9.85	1
1	3f	4990.08	
1	2b	0.34*	
2	3m	0.50	2
1	2f	0.68*	
1	2b	0.95	
3	3f	1.29	5
2	3f	1.82	2
3	3f	2.30	3
2	2b	2.79*	5
1	3f	3.04	
1	2b	3.23*	
2	2f	3.68	2
2	3f	3.96	1
2	3f	4.32	1
3	3b	4.86	4
1	2b	5.20	
3	3b	5.57	3
2	2b	6.03	0
1	2b	6.34*	
2	4b	6.60	8
1	2b	6.76*	
3	3f	7.20	8
2	3b	7.78*	10
1	2f	8.00	
2	2b	8.20*	1
2	2f	8.68	8
3	3f	9.06	7
3	3f	9.72	6
2	2b	5000.16	4
1	2b	0.50*	
2	4f	0.70	4
1	2b	0.82*	
1	2b	1.27	
3	4f	1.56	3
1	3b	2.19*	
2	4f	2.38	4
1	3b	2.53*	
1	2b	2.88	
3	3b	3.16	1
2	2b	3.58	1
3	3b	4.01	4
2	2b	4.58	1
3	3f	4.96	3
2	2b	5.32	2
2	2b	5.73	1
2	2b	6.31*	5
1	2b	6.61*	
1	5b	6.62	
2	4b	6.98*	6
2	2b	7.42	6
1	1b	7.58*	
1	3b	7.83	
1	1b	7.99*	
1	2b	8.27*	
2	3b	8.46	2
1	2b	8.62*	
2	3f	8.99*	2
1	5b	9.15	
2	2b	9.44*	6
2	2f	9.80*	3
1	6b	9.99	
2	3f	5010.38*	4
3	3f	0.89	2
2	2f	1.42	4
3	4f	1.81	4
1	3b	2.17	
1	2b	2.36*	
1	2b	2.54	
1	5b	2.66	
2	2b	2.89*	3
1	2b	3.24	
3	4f	3.54	2
1	2b	3.79	
3	3f	4.22	3
2	2b	4.64	6
3	3f	5.16	4
1	2b	5.69	
2	2f	5.94*	2
1	5b	6.04	
1	3b	6.31*	
3	3b	6.85	6
2	3b	7.34	2
2	3b	7.72	2
2	2f	8.06	6
1	2b	8.33	
3	3f	8.61	6
1	2b	9.03*	
1	4m	9.26	0
1	2b	9.38*	
1	2b	9.71*	
1	3f	9.84	
1	2b	5020.04*	
1	4b	0.23	
2	4f	0.44*	1

N	I	λ	d
3	3f	5020.99	2
1	2f	1.41	
2	4f	1.71	1
2	2f	1.86	1
2	3f	2.34	1
3	2b	2.73	3
2	2f	3.18	6
3	4f	3.49	2
1	2f	3.88*	
2	2f	4.16	2
1	2f	4.33*	
3	2f	4.74	4
1	3f	4.93	
3	3b	5.28	4
1	2f	5.60*	
1	3b	5.83	
2	2b	6.05*	3
1	2f	6.31	
3	3f	6.67	2
1	2b	7.03	
2	2f	7.26	6
2	4f	7.80	2
1	2b	8.09	
1	2b	8.35*	
1	2b	8.72*	
1	6f	8.74	
1	2b	9.13*	
1	3b	9.41*	
1	5f	9.49	
1	2b	9.81*	
1	2b	5030.16*	
1	3f	0.41	
2	2f	0.55*	1
3	2f	1.00	5
2	2b	1.44*	10
1	4b	1.48	
2	2f	1.72*	8
2	2f	2.02	10
3	2b	2.36	9
3	3f	2.80	1
2	2f	3.08	5
3	3f	3.53	6
1	3f	3.97	
3	4f	4.45	1
1	2f	4.83	
2	2f	5.18	2
3	3m	5.66	3
1	2b	6.04*	
1	4m	6.29	
2	4f	6.40*	0
1	2b	6.97*	
2	2f	7.08	3
1	2b	7.42*	
2	2f	7.64*	4
1	4f	7.79	
2	2f	8.00*	2
2	2b	8.40	2
2	2b	8.74*	1
1	6f	8.91	
2	2b	9.16*	12
3	2f	9.70	6
2	2f	5040.27*	6
1	3b	0.41	
2	2f	0.74*	2
3	3f	1.28	6
2	2b	1.65	8
2	2b	1.91	3
2	2f	2.28	8
1	4f	2.74*	
1	2f	3.05*	
1	4m	3.12	
1	3f	3.45*	
2	2f	3.87	6
1	3f	4.45*	
1	3f	4.89	
1	3f	5.09*	
2	4b	5.50	2
1	2b	5.86	
1	3f	6.28*	
1	1m	6.53	
1	2f	6.75*	
2	2f	7.16	6
2	4f	7.57	3
1	2f	8.04	
2	2f	8.38	6
1	2b	8.77*	
1	3f	9.16*	
1	9f	9.28	
1	3f	9.67*	
2	3b	5050.07	7
1	2f	0.47*	
1	8f	0.93	
1	2f	0.99*	
1	3f	1.49*	
2	3f	1.82	6
1	3f	2.29*	
1	4f	2.50	
1	2b	2.62*	
1	3f	2.98	
2	4f	3.56	2
1	2b	4.01	
3	4f	4.44	4
2	2f	4.86	4
3	4f	5.30	2
2	2f	5.76*	6
1	3b	5.98*	
1	5f	6.15	
2	2b	6.21*	3
2	3b	6.68*	5
1	2f	6.95*	
1	3f	7.10	
2	2f	7.22*	2
2	2f	7.71	6
3	3f	8.17	6
1	2f	8.69*	
2	2f	8.81	3
1	2b	9.02*	
2	3f	9.36*	4

N	I	λ	d
1	6m	5059.58	
2	2f	9.75*	4
1	2b	5060.06	
1	4b	0.30*	
2	3m	0.44	6
1	2b	0.67*	
3	3f	0.98	1
3	4f	1.64	2
3	2b	2.14	4
2	2b	2.42	3
3	3f	2.87	4
2	2f	3.45	9
2	2b	4.04*	1
1	4b	4.28	
2	2b	4.43*	2
3	2b	5.09	7
3	3f	5.66	4
1	2b	6.00	
3	3f	6.36	5
2	2f	6.95*	3
1	4b	7.37	
2	2b	7.62*	2
2	2b	8.03*	0
1	4b	8.24	
2	2b	8.50*	4
2	3f	8.87*	0
1	4f	9.09	
2	2f	9.34*	2
2	2b	9.74	4
3	3f	5070.22	2
2	2f	0.66*	12
1	3f	1.01	
2	3f	1.28*	8
2	2b	1.71*	2
1	3b	1.80	
2	3b	2.10*	6
3	2b	2.69	6
2	2b	3.20*	4
1	3b	3.50	
2	4f	3.86*	4
1	2b	4.27	
3	5f	4.74	4
1	2f	5.16	
2	2b	5.64	2
1	2b	5.95	
1	3b	6.35	
2	2b	6.78	5
1	4f	7.56*	
1	6f	7.78	
1	3f	8.04*	
1	2b	8.61*	
1	3f	8.83	
1	3b	8.97*	
2	4b	9.39	4
1	4b	9.89	
2	6f	5080.57	0
2	2f	1.30	4
1	2b	1.97*	
1	5b	2.26	
1	3b	2.47*	
2	2b	2.97	4
1	2b	3.48	
2	4b	4.04	4
1	2b	4.33	
2	3f	4.76	1
2	3f	5.39	9
2	2f	5.88	2
2	2b	6.48	2
2	2f	6.96	6
2	2b	7.48	4
1	2b	7.95*	
1	5f	8.21	
1	3b	8.40*	
2	2b	9.14	0
1	2b	9.63*	
1	4f	9.84	
1	2b	9.98*	
1	3b	5090.51	
2	2f	0.90	2
1	2b	1.53*	
1	4f	1.93	
1	2b	2.12*	
2	2f	2.68	2
1	2f	3.00	
2	3f	3.56	2
1	3f	4.02	
3	3f	4.48	7
2	2b	4.98*	10
1	3f	5.29	
2	2b	5.47*	9
1	2b	5.79	
2	2f	6.02	2
1	3f	6.21	
3	3f	6.58	3
1	3f	7.04*	
2	4f	7.22	2
1	2f	7.42*	
2	4f	7.98	8
1	2b	8.56*	
1	3f	8.72	
1	2b	8.90*	
1	2b	9.29	
2	2b	9.74	1
1	2b	5100.11*	
1	3b	0.45*	
1	4f	0.48	
1	2b	0.83*	
1	5b	1.37*	
1	4m	1.44	
1	2b	1.73*	
2	1f	2.04	2
2	2b	2.37	0
1	2b	2.78	
2	2f	3.09	0
1	3b	3.49	
2	2b	4.12	14
1	3b	4.79*	
1	6b	4.92	

N	I	λ	d
1	2f	5105.25*	
1	2b	5.80	
1	2b	6.27*	
1	4b	6.55	
1	2b	6.83*	
1	2b	7.12*	
1	7b	7.36	
1	2b	7.70*	
1	2b	8.04*	
1	4m	8.34	
2	2f	8.36*	
2	2b	8.80*	
1	2b	9.14*	
2	4f	9.28	
1	2b	9.48*	
2	2b	9.71	
1	2b	5110.06*	
1	10b	0.57	
1	2b	0.57*	
1	2b	1.00*	
1	1b	1.34	
2	3f	1.75	
1	3b	2.16	
2	2f	2.51	
1	1b	2.89	
2	2b	3.20	
1	2b	3.53*	
1	4f	3.79	
1	2f	4.16*	
1	2f	4.44*	
1	3f	4.65*	
2	4f	4.75	
1	2f	5.11*	
3	3f	5.55	
2	3f	6.08*	
1	3f	6.28	
2	2f	6.50*	
1	2b	6.86	
1	5f	7.01*	
1	5f	7.10	
1	3f	7.17	
2	4f	7.65*	
3	2f	8.05	
3	3b	8.48	
1	2f	8.85*	
1	2b	9.45*	
1	10f	9.47	
1	2b	9.72*	
1	1f	9.99	
1	2b	5120.30	
1	2f	0.64*	
1	10f	0.87	
1	2b	0.97*	
1	2f	1.40*	
1	3b	1.89	
2	3f	2.28	
1	2b	2.69	
1	2f	3.11	
1	2b	3.41	
1	2b	3.63	
1	1b	4.23	
1	2b	4.72	
1	3f	5.06	
1	2b	5.39	
1	2b	5.79	
1	3b	6.15	
1	3b	6.60	
1	3b	7.00	
1	2b	7.37	
1	2b	7.63	
1	3b	8.13	
1	1b	8.40	
2	2b	8.76	
1	2b	9.10*	
1	3f	9.34	
1	2f	9.49*	
2	3f	9.91	
2	2b	5130.33	
2	2b	0.62	
1	2b	0.89*	
1	2b	1.03	
1	2b	1.26*	
2	4b	1.44	
1	2b	1.76*	
1	2m	1.98	
1	4b	2.09*	
2	2b	2.50	
1	2b	2.79*	
1	2b	2.98	
1	2b	3.09*	
2	2f	3.39	
1	3b	3.54	
2	2b	3.85	
2	3b	4.24	
2	2b	4.64	
1	2b	5.11	
1	4m	5.90	
1	3f	6.49	
1	2b	7.06	
1	3b	7.54	
1	2b	8.02	
1	4b	8.57	
1	3b	9.14	
1	2b	9.59	
1	3b	5140.05	
1	2f	0.66	
1	2f	1.10	
1	3f	1.64	
1	2b	2.14	
1	4f	2.64	
1	3b	3.17	
1	2b	3.67	
1	2b	3.94	
1	3b	4.48	
1	2f	5.03	
1	5m	5.84	
1	2m	6.78	
1	2b	7.51	

N	I	λ	d
1	2b	5147.88	
1	3b	8.39	
1	2b	8.85	
1	1b	9.25	
1	4m	5150.10	
1	3b	0.96	
1	3m	1.62	
1	3b	2.39	
1	2b	2.74	
1	2b	3.35	
1	2b	3.78	
1	3f	4.24	
1	2b	4.70	
1	3f	5.33	
1	2f	5.83	
1	2f	6.40	
1	2f	6.94	
1	1b	7.41	
1	3f	7.82	
1	3f	8.30	
1	2f	8.87	
1	1b	9.29	
1	1b	9.72	
1	2b	5160.15	
1	2b	0.53	
1	3b	0.90	
1	1b	1.26	
1	3f	1.59	
1	3f	2.15	
1	2f	2.60	
1	5f	3.20	
1	1f	3.78	
1	5f	4.40	
1	2f	4.85	
1	2b	5.47	
1	3b	5.78	
1	2b	6.08	
1	2b	6.95	
1	4b	7.44	
1	3f	8.16	
1	2b	8.63	
1	2b	9.06	
1	2b	9.68	
1	3f	5170.20	
1	3b	0.87	
1	2b	1.16	
1	2b	1.48	
1	3b	1.89	
1	2f	2.31	
1	3m	2.90	
1	4f	3.57	
1	5b	4.19	
1	2b	4.78	
1	2b	5.39	
1	2b	6.02	
1	3b	6.48	
1	3f	7.01	
1	3f	7.37	
1	3m	8.18	
1	3f	8.59	
1	2m	9.43	
1	2f	5180.05	
1	3f	0.52	
1	2f	1.04	
1	2b	1.36	
1	2f	1.76	
1	2b	2.13	
1	3f	2.48	
1	3b	2.94	
1	4b	3.42	
1	2b	3.91	
1	3b	4.32	
1	6f	4.88	
1	2b	5.42	
1	3b	5.74	
1	3b	6.14	
1	3f	6.77	
1	2f	7.29	
1	5m	8.01	
1	5m	8.80	
1	2f	9.51	
1	2b	9.96	
1	4f	5190.52	
1	3b	1.13	
1	3f	1.60	
1	2f	1.99	
1	2f	2.38	
1	2b	2.76	
1	3b	3.13	
1	4f	3.63	
1	3f	4.19	
1	4b	4.79	
1	4f	5.29	
1	2f	5.86	
1	4f	6.34	
1	2f	6.91	
1	2b	7.25	
1	3f	7.67	
1	2b	7.97	
1	3b	8.35	
1	2f	8.81	
1	4m	9.51	
1	4m	5200.17	
1	2b	0.76	
1	2b	1.07	
1	2f	1.53	
1	2b	2.01	
2	2b	2.63	13
2	2f	3.06	4
1	2b	3.42*	
1	2b	3.57*	
1	3m	3.63	
1	2b	3.83*	
2	2f	4.14	2
1	2b	4.51*	
1	3b	4.63	
1	2b	4.88*	
1	2b	5205.19	
1	1b	5.56	
1	2b	5.93	
1	2b	6.28	
1	2b	6.64	
1	2b	6.94	
1	2b	7.22	
1	3b	7.56	
1	1b	7.95	
1	3b	8.29	
1	1b	8.65	
1	2b	8.89	
1	2b	9.15	
1	2b	9.42	
1	3f	9.81	
1	3b	5210.17*	
1	3m	0.30	
1	2b	0.54*	
2	3f	0.96	1
1	2f	1.49	
1	3f	2.10	
1	2f	2.64	
1	2b	3.15	
1	3f	3.80	
1	3f	4.33	
1	2f	4.91	
1	2m	5.35	
1	2b	5.76	
1	2b	6.12	
1	2b	6.47	
1	4b	7.14	
1	2b	7.66	
1	5b	8.27	
1	4s	9.42	
1	4m	5220.60	
1	2b	1.29	
1	3b	1.95	
1	2b	2.40	
1	2b	2.87	
1	2b	3.25	
1	3b	3.76	
1	2f	4.27	
1	2f	4.75	
1	2b	5.22	
1	2b	5.63	
1	2b	6.10	
1	1b	6.45	
1	2b	6.78	
1	1b	7.13	
1	1b	7.38	
1	2b	7.67	
1	2b	8.00	
1	2f	8.39	
1	2b	8.84	
1	2b	9.26	
1	2b	9.66	
1	3f	5230.15	
1	3b	0.71	
1	3b	1.13	
1	2f	1.85	
1	2f	2.28	
1	2b	2.70	
1	2b	3.06	
1	3b	3.48	
1	3b	3.99	
1	3m	4.80	
1	3b	5.59	
1	2b	6.02	
1	2f	6.40	
1	3b	6.90	
1	3b	7.49	
1	3b	8.00	
1	2b	8.55	
1	5m	9.34	
1	2b	5240.10	
1	4f	0.67	
1	3f	1.26	
1	2b	1.74	
1	5b	2.23	
1	3f	2.76	
1	5f	3.75	
1	2b	4.38	
1	3b	4.97	
1	2b	5.40	
1	6m	6.05	
1	3f	6.77	
1	2m	7.51	
1	2b	7.92	
1	3b	8.36	
1	2b	8.74	
1	2b	9.02	
1	3b	9.49	
1	3f	9.93	
1	2b	5250.37	
1	2b	0.79	
1	2b	1.17	
1	3b	1.80	
1	3b	2.44	
1	2b	2.97	
1	2b	3.34	
1	3b	3.89	
1	4b	4.36	
1	4b	4.93	
1	2b	5.74	
1	3b	6.47	
1	2b	6.89	
1	2b	7.34	
1	2b	7.69	
1	2b	8.10	
1	3f	8.57	
1	2f	9.01	
1	2f	9.34	
1	3f	9.84	
1	2b	5260.35	
1	3f	0.83	
1	3f	1.33	
1	3b	1.74	
1	3b	5262.13	
1	2b	2.63	
1	2b	2.95	
1	2f	3.36	
1	2b	3.88	
1	2b	4.33	
1	3b	4.70	
1	3b	5.20	
1	3b	5.81	
1	2f	6.31	
1	2b	6.78	
1	3b	7.23	
1	2b	7.68	
1	2b	7.72	
1	2b	8.26	
1	2b	8.59	
1	3b	9.01	
1	2b	9.39	
1	2f	9.72	
1	2b	5270.08	
1	4f	0.27	
1	2b	0.68	
1	2b	0.97	
1	3f	1.78	
1	2f	2.45	
1	2f	2.86	
1	1f	3.35	
1	4f	3.90	
1	2f	4.59	
1	2f	5.02	
1	2f	5.44	
1	2f	5.85	
1	2f	6.30	
1	3f	6.78	
1	2b	7.18	
1	1b	7.46	
1	2b	7.80	
1	2b	8.08	
1	2f	8.40	
1	3f	8.90	
1	2b	9.32	
1	2f	9.72	
1	3f	5280.14	
1	2f	0.67	
1	2b	1.02	
1	2f	1.33	
1	2b	1.72	
1	2b	2.37	
1	3m	2.93	
1	3b	3.38	
1	2f	3.77	
1	2b	4.17	
1	3f	4.56	
1	3m	5.34	
1	4f	5.97	
1	4f	6.54	
1	2b	6.99	
1	3b	7.35	
1	2b	7.80	
1	4f	8.33	
1	3f	8.92	
1	2b	9.39	
1	2b	9.75	
1	2f	5290.19	
1	1b	0.52	
1	2b	0.78	
1	3m	1.25	
1	2f	1.77	
1	1b	2.14	
1	1b	2.41	
1	2b	2.68	
1	2f	3.01	
1	3f	3.48	
1	4f	4.01	
1	4f	4.38	
1	1f	5.07	
1	2b	5.82	
1	1b	6.09	
1	2b	6.46	
1	2b	6.84	
1	2b	7.24	
1	2b	7.66	
1	6s	8.20	
1	3f	8.91	
1	1b	9.32	
1	2s	9.67	
1	2b	5300.07	
1	1b	0.35	
1	2b	0.75	
1	2f	1.33	
1	2f	1.69	
1	3s	2.24	
1	2b	2.81	
1	3b	3.44	
1	4b	3.86	
1	2f	4.42	
1	3f	4.87	
1	3b	5.25	
1	3b	5.56	
1	3f	6.11	
1	4m	6.92	
1	3b	7.57	
1	2b	8.01	
1	3b	8.45	
1	2f	8.96	
1	3s	9.49	
1	2b	9.96	
1	3b	5310.32	
1	3b	0.82	
1	1b	1.20	
1	2b	1.48	
1	3b	1.71	
1	4b	2.05	
1	2b	2.50	
1	3b	2.88	
1	3m	3.46	
1	3f	4.03	
1	3b	5262.13	
1	2b	2.63	
1	2b	2.95	
1	2f	3.36	
1	2b	3.88	
1	2b	4.33	
1	3b	4.70	
1	3b	5.20	
1	3b	5.81	
1	2f	6.31	
1	2b	6.78	
1	3b	7.23	
1	2b	7.68	
1	2b	7.72	
1	2b	8.26	
1	2b	8.59	
1	3b	9.01	
1	2b	9.39	
1	2f	9.72	
1	2b	5270.08	
1	4f	0.27	
1	2b	0.68	
1	2b	0.97	
1	3f	1.78	
1	2f	2.45	
1	2f	2.86	
1	1f	3.35	
1	4f	3.90	
1	2f	4.59	
1	2f	5.02	
1	2f	5.44	
1	2f	5.85	
1	2f	6.30	
1	3f	6.78	
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1	2b	8.08	
1	2f	8.40	
1	3f	8.90	
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1	3f	5280.14	
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1	2b	1.72	
1	2b	2.37	
1	3m	2.93	
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1	2f	3.77	
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1	3f	4.56	
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1	3f	3.48	
1	4f	4.01	
1	4f	4.38	
1	1f	5.07	
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1	2b	7.24	
1	2b	7.66	
1	6s	8.20	
1	3f	8.91	
1	1b	9.32	
1	2s	9.67	
1	2b	5300.07	
1	1b	0.35	
1	2b	0.75	
1	2f	1.33	
1	2f	1.69	
1	3s	2.24	
1	2b	2.81	
1	3b	3.44	
1	4b	3.86	
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1	3f	4.87	
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1	3f	6.11	
1	4m	6.92	
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1	2f	8.96	
1	3s	9.49	
1	2b	9.96	
1	3b	5310.32	
1	3b	0.82	
1	1b	1.20	
1	2b	1.48	
1	3b	1.71	
1	4b	2.05	
1	2b	2.50	
1	3b	2.88	
1	3m	3.46	
1	3f	4.03	
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1	3f	4.86	
1	2f	5.27	
1	2f	5.63	
1	4m	6.41	
1	2f	6.97	
1	3f	7.45	
1	2*	7.87	
1	3b	8.29	
1	3f	8.88	
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1	3f	5320.16	
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1	2b	3.53	
1	3m	3.92	
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1	4s	5.30	
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1	3f	6.50	
1	2b	7.07	
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1	3b	8.24	
1	3b	8.53	
1	2b	9.27	
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1	3f	2.16	
1	4f	2.87	
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2	3f	3.60	2
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2	3b	5.81	1
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2	3b	7.90	6
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2	4f	9.14	2
2	6f	9.96	1
1	3b	5360.73	
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2	3f	1.83	3
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1	1b	2.66	
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2	2b	5.98	1
2	2f	6.42	4
2	4f	7.19	2
1	2b	7.48	
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2	2b	4.94	2
2	2b	5375.26	1
2	2b	5.68	4
2	2f	6.24	1
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1	4f	9.60	
1	3f	5380.12	
1	2f	0.62	
1	2f	0.87	
1	1f	1.25	
1	1f	1.66	
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1	3f	2.56	
1	4f	3.27	
1	3f	3.95	
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1	2f	4.92	
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1	2b	6.65	
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1	2f	9.53	
1	3f	5390.07	
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1	3s	1.51	
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1	1f	3.10	
1	6s	3.67	
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1	3b	5.66	
2	3f	6.08	6
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1	3f	7.39*	
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1	2b	8.28	
2	2f	8.61	0
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1	2b	9.70*	
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2	3f	1.25	8
2	2b	1.84	1
1	3b	2.47*	
1	3b	2.70	
1	2b	2.90*	
2	2b	3.30	6
1	3b	3.69*	
1	3b	3.86	
1	2b	4.11*	
2	2f	4.40	8
2	2b	4.84	6
1	2b	5.12	
1	2b	5.57	
1	3b	6.25	
1	2b	6.77	
1	2f	7.08	
1	2b	7.59	
1	2b	7.89	
1	3f	8.32	
1	3b	9.32	
1	2b	9.86	
1	2b	5410.28	
1	2b	0.77	
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1	2f	1.86	
1	3f	2.37	
1	2b	3.09	
1	2b	3.49	
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1	2f	5420.15	
1	2f	0.52	
1	3f	1.03	
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1	3f	1.91	
1	3f	2.28	
1	3f	2.69	
1	2f	3.10	
1	3f	3.61	
1	2b	4.05	
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1	3f	5.29	
1	2b	5.92	
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1	3m	6.66	
1	3f	7.20	
1	2f	7.61	
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1	4m	8.79	
1	1f	9.31	
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1	3s	6.03	
1	1b	6.40	
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1	2b	7.37	
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1	2f	8.24	
1	3b	8.80	
1	2b	9.32	
1	1b	9.83	
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1	2f	1.62	
1	2f	2.07	
1	3b	2.60	
1	4f	3.13	
1	3f	3.63	
1	3b	4.19	
1	2b	4.84	
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1	2f	6.03	
1	1f	6.39	
1	3b	6.81	
1	3f	7.22	
1	2f	7.72	
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1	2f	8.48	
1	3f	9.00	
1	2b	9.40	
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1	4f	5450.32	
1	3s	0.91	
1	2b	1.34	
1	2b	1.72	
1	3f	2.22	
1	2f	2.58	
1	3s	3.23	
1	3f	3.93	
1	2f	4.32	
1	1f	4.70	
1	1f	5.04	
1	2f	5.40	
1	2f	5.79	
1	2f	6.25	
1	3f	6.66	
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1	2f	8.54	
1	2f	8.93	
1	2b	9.34	
1	2b	9.75	
1	3b	5460.17	
1	3f	0.63	
1	1b	1.12	
1	1b	1.38	
1	2b	1.75	
1	2f	2.37	
1	2b	2.88	
2	4f	3.48	2
2	2b	4.12	4
2	2f	4.48	2
1	2b	4.87	
2	2f	5.20	5
2	4m	5.84	0
2	3f	6.57	6
2	2f	7.07	2
2	4f	7.67	3
1	1b	8.10	
1	2f	8.52*	
1	3b	8.69	
1	2b	8.82*	
2	4f	9.21	4
2	2b	9.70	2
1	2b	5470.00*	
1	4f	0.25	
1	3f	0.82*	
2	3f	0.96	2
2	2f	1.48	3
1	3s	1.98	
1	1b	2.37	
1	2f	2.70	
1	2f	3.08	
1	3f	3.82	
1	3m	4.43	
1	2m	5.23	
1	1f	5.61	
1	4f	6.08	
1	2b	6.65	
1	3b	7.05	
1	2f	7.41	
1	4f	7.88	
1	2b	8.58	
1	2b	8.89	
1	3f	9.31	
1	1b	9.66	
1	2b	5480.12	
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1	3f	1.26	
1	2f	1.72	
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1	1f	2.44	
1	5f	2.99	
1	3f	3.68	
1	5f	4.42	
1	2b	5.17	
1	3b	5.74	
1	3f	6.12	
1	3m	6.53	
1	2f	6.96	

N	I	λ	d
1	3b	5487.44	
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1	3m	9.22	
1	2f	9.81	
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1	2f	0.62	
1	1f	0.91	
1	1b	1.18	
1	3m	1.60	
1	2f	2.10	
1	2f	2.57	
1	2f	2.90	
1	3f	3.42	
1	2b	3.87	
1	4f	4.41	
1	2s	4.94	
1	2f	5.50	
1	3b	5.90	
1	2b	6.27	
1	2b	6.86	
2	2b	7.20	2
2	2f	7.66	4
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2	2b	8.54	4
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2	4f	9.54	6
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2	2b	0.70	1
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1	2b	1.48	
2	2b	1.72	6
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1	2b	2.59*	
2	3f	2.98	6
2	4f	3.54	2
1	2b	3.99	
2	3f	4.33	3
2	2f	4.91	2
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1	2b	5.94	
1	3b	6.19*	
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2	2f	8.02	6
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2	2b	9.14	2
1	3b	9.49	
2	2b	9.79	4
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2	2b	2.70	4
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2	2b	3.50	4
2	2b	3.94	4
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2	2b	5.08	8
2	3f	5.52	6
2	3f	5.97	1
2	4f	6.44	2
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1	6f	7.11	
1	2b	7.25*	
2	4f	7.78	6
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2	3f	8.75	5
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2	4f	4.00	4
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1	2b	5.79*	
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1	3b	9.45	
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1	3f	4.75	
1	5m	5.22	
1	4f	5.93	
1	2b	6.36	
1	4b	6.83	
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1	3b	7.71	
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1	2f	8.45	
1	2b	8.90	
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1	2f	9.58	
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1	4f	0.45	
1	3b	1.00	
1	3f	1.56	
1	3f	1.98	
1	3b	2.33	
1	3b	2.70	
1	2b	3.11	
2	5f	3.66	1
2	2f	4.41	2
2	4f	4.96	2
2	3f	5.64	8
2	2f	6.14	6
2	2f	6.62	4
2	4f	7.12	1
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1	5b	7.89	
1	2b	8.19*	
2	4m	8.72	2
1	2b	9.05	
2	3f	9.46	2
2	2b	9.95	4
2	4f	5610.54	6
2	3b	1.10	2
2	2b	1.46	2
2	2f	1.86	4
2	3f	2.48	6
2	2f	3.02	3
1	3f	3.47*	
1	3b	3.70	
1	3f	4.00*	
1	2b	4.28	
2	3f	4.78	4
2	2f	5.34	2
1	2b	5.61	
2	2b	5.87	7
2	2b	6.26	1
2	3b	6.68	2
2	4b	7.26	3
1	2b	7.69	
1	2b	8.05	
2	3f	8.40	2
1	2b	8.80	
2	2f	9.22	6
2	2b	9.65	1
2	2b	5620.06	4
1	1b	0.46	
2	3f	0.65	5
2	3f	1.30	6
1	1b	1.61	
2	5f	2.00	1
1	2b	2.51	
1	3b	2.83	
1	2f	3.25	
1	3b	3.72	
1	3b	4.17	
1	2f	4.63	
1	3b	4.94	
2	4m	5.50	1
2	3f	5.96	1
2	3m	6.43	2
2	2f	6.91	3
2	6m	7.50	1
2	3f	8.15	1
2	3f	8.76	2
2	4f	9.27	2
1	3m	9.67*	
1	4f	9.85	
1	4m	5630.02*	
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2	2f	1.16	2
2	2f	1.58	2
2	2b	1.98	2
2	2f	2.34	1
2	2f	2.82	1
1	2b	3.12*	
1	2f	3.36	
1	2b	3.43*	
2	3f	3.90	1
1	2b	4.26	
2	2m	4.60	2
2	2f	5.09	2
2	2f	5.42	2
2	2f	5.80	1
2	2f	6.18	2
2	2f	6.62	1
1	3f	7.06*	
1	4s	7.17	
1	3b	7.44*	
2	2f	7.72	2
2	2f	8.12	1
2	2f	8.61	1
1	2f	8.81*	
1	4f	9.00	
1	2b	9.18*	
1	1b	5639.55	
2	4m	5640.07	5
2	2f	0.64	2
2	2m	1.01	1
2	2f	1.44	2
2	2f	1.84	1
2	2f	2.23	1
2	2b	2.56	4
2	3f	2.98	1
2	2f	3.41	1
2	2b	3.83	4
2	2f	4.10	1
2	4f	4.53	1
2	2b	4.96	1
2	3m	5.40	1
2	2f	5.90	4
2	2f	6.24	3
2	2f	6.60	4
2	2f	6.97	6
2	2b	7.36	2
2	2b	7.77	8
2	2b	8.10	11
2	2b	8.48	3
2	2f	8.84	2
2	3f	9.16	1
2	2b	9.60	1
1	3b	9.96*	
1	4f	5650.19	
1	2f	0.39*	
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2	2f	1.36	1
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1	1b	2.22	
2	2f	2.52	1
2	2b	2.90	0
2	2f	3.28	1
2	1b	3.72	1
2	2m	4.06	1
2	2f	4.61	3
2	2f	4.97	0
2	3f	5.43	1
2	2b	5.93	1
2	2f	6.28	0
2	2f	6.74	6
2	2m	7.22	1
2	1f	7.56	2
2	2f	7.98	1
2	2f	8.35	0
2	2m	8.85	0
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1	1f	0.90	
1	4f	1.35	
1	2f	1.77	
1	3f	2.35	
2	3f	2.85	3
1	2b	3.26	
1	3b	3.67	
1	2b	4.11	
1	3f	4.56	
1	1b	4.85	
1	4b	5.25	
1	2b	5.67	
2	3f	6.16	1
2	4f	6.96	2
2	4b	7.62	4
1	1b	7.93	
2	3f	8.28	1
1	3f	8.83	
1	2f	9.17	
1	3f	9.55	
1	3f	9.95	
1	3f	5670.43	
1	1f	0.86	
1	1b	1.29	
1	2b	1.72	
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2	2f	2.83	3
2	2f	3.19	1
2	3m	3.68	1
2	2f	4.06	1
2	2f	4.56	2
2	2f	5.06	2
2	4b	5.53	8
2	2f	6.02	6
2	2m	6.52	2
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2	3b	7.61	2
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1	2b	1.40	
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2	4m	2.22	2
2	2f	2.60	1
2	4m	3.05	1
2	2b	3.68	1
2	2b	4.10	1
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2	2b	4.72	4
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1	2b	5.60	
2	5m	6.16	2
1	1b	6.59	
2	3f	6.87	3
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1	2b	7.83	
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1	3b	8.73	
1	2b	9.18	
1	2b	9.74	
1	2b	5690.01	
1	3b	5690.35	
1	3f	0.75	
1	2f	1.16	
2	4m	1.66	1
1	3f	2.27	
1	2f	2.61	
1	2f	3.09	
1	2f	3.41	
2	2m	3.86	1
2	2f	4.28	2
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1	3b	4.82	
1	3b	5.05*	
1	2f	5.49	
1	3f	5.90	
1	2f	6.31	
2	2m	6.82	2
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2	4f	8.16	1
2	3f	8.70	4
1	1f	8.96	
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2	2b	9.92	1
2	2f	5700.32	0
2	2f	0.75	0
2	2b	1.23	7
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1	2b	2.03*	
1	5f	2.15	
1	1b	2.38*	
2	2f	2.84	1
2	2f	3.30	4
2	2f	3.74	0
2	4f	4.60	4
2	4b	5.12	4
1	3b	5.57*	
1	2f	5.76	
1	1b	5.87*	
2	4f	6.23	3
2	2m	6.76	2
2	2f	7.12	1
2	2b	7.48	2
1	2f	7.76*	
1	3b	7.94	
1	2f	8.03*	
2	2f	8.30	1
2	2f	8.68	2
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2	4m	9.92	2
2	3f	5710.36	3
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2	2f	1.46	1
2	3b	1.94	2
1	2b	2.23	
1	2b	2.40	
2	2b	2.74	2
2	2b	3.13	1
2	2b	3.44	2
2	2f	4.00	8
2	4f	4.52	1
2	2b	5.02	1
2	2m	5.41	0
2	3f	5.84	3
2	4f	6.44	6
1	3f	7.00*	
1	4f	7.12	
1	2b	7.30*	
2	2f	7.60	1
2	2f	8.02	1
2	2f	8.44	2
2	4f	8.90	2
2	2f	9.47	4
2	4m	5720.12	4
2	2b	0.52	3
2	3f	0.98	4
2	2b	1.28	1
2	2f	1.62	1
2	2f	1.96	1
2	2f	2.28	1
1	1f	2.56*	
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1	1f	2.91*	
1	2f	3.23	
2	2f	3.56	2
2	4f	4.00	2
2	2b	4.54	0
2	3f	5.06	2
1	2b	5.49	
2	4f	5.90	1
2	2f	6.41	2
1	2f	6.72	
1	2b	7.30	
1	2b	7.65	
2	2b	8.10	2
2	2f	8.46	2
2	2f	8.87	0
2	4m	9.38	4
2	3f	9.92	0
2	2f	5730.36	4
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2	2f	1.20	2
2	2f	1.56	2
1	3f	1.92*	
1	4f	2.05	
1	2f	2.21*	
2	2b	2.58	4
1	3b	3.02*	
1	2b	3.23	
1	2f	3.38*	
2	3m	3.86	2
1	2b	4.15	
2	2f	4.55	1
2	3f	4.99	2
1	3b	5.40	
1	2b	5.66	
2	3f	6.00	1
2	4b	6.56	2
1	2b	5736.93	
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1	2f	7.60*	
1	4f	7.88	
1	2f	8.02*	
2	4f	8.56	
1	2b	9.09	
1	3f	9.57	
1	2b	9.94	
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1	3f	1.07	
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1	3b	1.81	
1	3b	2.27	
1	2b	2.68	
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1	2b	4.99	
1	2b	5.48	
2	2f	5.86	
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1	4b	6.55	
1	2b	7.14	
1	2b	7.49	
1	3f	7.94*	
1	2b	8.18	
1	2b	8.57*	
1	2f	8.95	
1	2f	9.26*	
1	2b	9.43	
1	2f	9.58*	
1	3f	9.88	
1	3b	5750.27	
2	2f	0.79	
1	2b	1.14	
1	1b	1.39	
1	2b	1.67	
1	2b	2.11	
1	2b	2.44	
1	3b	2.83	
1	3b	3.42	
1	1b	3.75	
2	4f	4.24	
1	2f	4.78	
1	1b	5.11	
1	2b	5.43	
2	4f	6.08	
1	3f	6.66	
1	2b	7.13	
1	2b	7.60	
1	3b	8.08	
1	2b	8.49	
1	2b	9.03	
1	3b	9.61	
1	2b	5760.15	
1	2b	0.72	
1	2b	1.22	
1	2b	1.57	
1	2b	2.22	
1	2b	2.64	
1	3b	3.17	
1	2b	3.60	
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1	3b	4.93	
1	3f	5.37	
1	2b	5.76	
1	2b	6.06	
1	2b	6.43	
1	2b	6.76	
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1	2b	7.55	
1	2b	8.16	
1	3f	8.68	
1	2f	9.10	
1	2b	9.47	
1	3b	5770.00	
1	3f	0.61	
1	2b	1.01	
1	3f	1.49	
1	2f	1.92	
1	3f	2.32	
1	2b	2.69	
1	3f	3.24	
1	2f	3.60	
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1	2f	5.69	
1	3f	6.30	
1	3f	6.76	
1	3f	7.30	
1	2b	7.69	
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1	2f	8.36	
1	3f	8.71	
1	2f	9.07	
1	3f	9.45	
1	4f	5780.09	
1	3f	0.67	
1	3f	1.24	
1	3f	1.59	
1	3f	2.09	
1	3f	2.48	
1	5f	3.02	
1	4f	3.63	
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1	3b	4.85	
1	3b	5.42	
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2	2f	6.52	
2	2f	6.90	
2	2b	7.35	

N	I	λ	d
2	3b	5787.92	2
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2	2f	8.70	1
1	2b	8.99	
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2	4f	9.76	3
1	2b	5790.11	
2	2f	0.42	2
2	3f	0.88	2
2	2f	1.28	2
1	3b	1.53*	
1	2f	1.78	
1	2b	1.89*	
2	2f	2.14	2
2	2b	2.55	2
1	3b	2.79	
2	3m	3.20	2
2	2f	3.57	1
2	3f	3.91	0
2	4f	4.43	3
1	3f	4.86*	
1	3f	4.96	
1	2b	5.26*	
2	2f	5.64	2
2	2f	6.04	1
2	3f	6.44	2
2	4f	6.92	4
1	2b	7.33*	
1	2f	7.56	
1	2b	7.68*	
2	4f	8.10	2
2	3f	8.57	2
2	4f	9.04	1
1	2b	9.42	
2	3f	9.74	2
1	2b	5800.10*	
1	4f	0.35	
1	3f	0.69*	
1	2b	0.87*	
1	3f	1.07	
1	2b	1.27*	
2	2b	1.54	1
2	2f	2.19	7
2	3f	2.52	12
2	2f	3.02	6
2	3m	3.45	2
1	3f	3.88	
2	3f	4.36	2
2	4f	4.88	6
1	2b	5.18	
1	4b	5.73	
1	2b	6.11	
1	2f	6.47	
1	4f	6.91	
1	2f	7.29	
1	4f	7.65	
1	1b	8.00	
1	3f	8.34	
1	2f	8.74	
1	3f	9.30	
1	3b	9.79	
1	3b	5810.24	
1	3b	0.82	
1	3b	1.25	
1	2b	1.65	
1	3f	2.16	
1	2b	2.67	
1	5b	3.16	
1	3f	3.66	
1	3b	4.16	
1	3b	4.67	
1	2b	5.10	
1	2b	5.73	
1	3f	6.09	
1	3b	6.54	
1	3b	7.13	
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1	2b	0.92	
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1	2b	2.74	
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1	3b	3.47	
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2	3f	5.78	2
2	2f	6.22	9
2	4s	6.72	1
2	4f	7.32	1
2	2f	7.76	4
2	3f	8.04	3
2	2f	8.44	1
1	3m	8.86*	
1	4f	8.98	
1	2b	9.28*	
2	4m	9.67	0
1	2b	5850.07*	
1	3f	0.30	
1	3b	0.42*	
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1	2b	2.70*	
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2	3f	3.42	2
2	2f	3.79	2
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1	4f	4.31	
2	2f	4.48*	
2	3m	4.79	1
2	4f	5.30	1
1	2f	5.73*	
1	4f	5.84	
1	2f	6.03*	
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2	3s	6.78	0
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2	4f	7.67	1
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1	2f	2.29*	
1	4f	2.44	
1	2f	2.63*	
2	4f	3.02	4
1	2f	3.29	
2	2f	3.52	3
2	2f	3.80	0
2	2f	4.21	10
2	2b	4.58	10
2	3f	4.96	6
2	2f	5.43	2
2	3f	5.86	1
2	4f	6.28	2
2	2f	6.65	2
2	4f	6.96	6
2	3m	7.46	2
2	3f	7.94	1
2	4f	8.42	1
2	3f	8.95	1
1	3f	9.40*	
1	4f	9.53	
1	2f	9.74*	
2	3f	5870.06	6
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2	2f	1.06	4
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2	2f	1.77	1
2	4f	2.29	8
2	2b	2.65	2
2	3f	3.00	2
2	4f	3.52	4
2	2f	3.88	0
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2	2f	4.60	4
2	2f	4.86	1
2	2f	5.24	2
2	3f	5.65	3
2	3f	6.06	2
2	2f	6.46	1
2	2b	6.84	2
2	3f	7.21	3
2	2f	7.60	1
2	3b	8.06	2
1	2b	8.47	
2	3b	8.88	1
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1	3b	9.46	
2	2b	9.73	2
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1	2b	0.38	
2	4f	5880.92	4
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1	3f	1.80	
1	4f	2.36	
1	2b	2.80	
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1	2b	8.11	
1	4b	8.55	
1	3b	9.09	
1	3b	9.60	
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2	2f	1.80	3
1	3b	2.11*	
1	3b	2.24	
1	2f	2.41*	
2	4m	2.83	0
2	2f	3.26	1
2	3f	3.67	4
2	2f	4.07	0
1	2b	4.39	
2	3f	4.70	1
2	2f	5.15	7
2	2b	5.57	4
2	2f	6.43	1
2	2f	6.76	1
2	2f	7.14	2
2	2f	7.54	2
2	2b	7.95	3
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2	2f	8.76	4
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2	2b	9.50	1
2	3f	9.91	1
2	2f	5900.26	2
2	2m	0.65	1
2	2f	1.01	1
1	2b	1.28	
2	2f	1.64	1
2	4f	2.18	4
2	4m	2.78	0
2	4m	3.26	1
2	3f	3.68	1
2	2f	4.11	5
2	3f	4.41	3
2	2f	4.76	2
2	2f	5.16	6
2	3f	5.60	2
1	2b	5.81	
2	4f	6.16	1
2	2f	6.68	2
2	6f	7.29	3
2	2f	7.78	4
2	3f	8.26	4
2	2f	8.75	2
2	3f	9.22	2
2	2f	9.76	1
1	2b	5910.10	
1	2f	0.57	
1	3f	0.99	
2	3f	1.48	1
2	2f	1.88	2
2	3f	2.19	8
2	2f	2.60	5
2	2f	2.98	2
2	2f	3.47	2
2	2s	3.90	2
2	2f	4.36	4
1	1f	4.64	
2	4f	4.90	3
2	2f	5.44	4
2	4m	6.04	1
2	2f	6.62	1
2	4f	7.14	2
2	2f	7.60	2
2	2m	8.01	2
2	2f	8.43	3
2	2b	8.77	0
2	4f	9.20	4
2	2f	9.65	0
1	3f	5920.03*	
1	3f	0.13	
1	2f	0.41*	
2	4f	0.72	2
2	2f	1.14	2
2	4f	1.70	2
2	2f	2.10	6
2	4f	2.48	4
2	2f	2.98	2
2	4m	3.39	6
2	2b	3.86	1
1	2b	4.18	
1	2b	4.49	
1	2f	4.94	
2	4m	5.41	2
2	2b	5.90	2
2	2b	6.24	2
2	2f	6.66	2
2	4s	7.08	1
2	2f	7.52	5
2	4m	7.88	4
2	4b	8.38	2
2	3m	8.84	2
2	2f	9.22	2
2	2f	9.51	5
2	2f	9.92	1
2	2f	5930.34	2
2	3m	0.80	2
2	4m	5931.28*	1
1	3b	1.61	
2	3m	1.82*	0
3	2b	2.16	1
3	2b	2.52	2
3	2b	2.94	4
1	3b	3.23*	
2	4f	3.41	3
1	4b	3.57*	
3	3f	3.96	3
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2	3b	4.86	2
3	3f	5.19	7
3	3f	5.70	3
2	2b	6.04	5
3	4b	6.52	2
3	3b	7.00	2
1	2b	7.30*	
2	2f	7.41	2
1	3b	7.67*	
3	2b	7.86	8
3	3f	8.33	2
3	3f	8.84	4
1	3f	9.08	
3	3f	9.44	5
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2	4f	1.62	4
2	4f	2.06	6
2	2b	2.54	2
1	1b	2.88	
2	4f	3.10	4
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2	4f	4.60	6
2	4m	5.06	7
2	2f	5.56	5
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1	3b	6.09	
1	3f	6.31*	
2	2f	6.59	3
2	3b	6.93	6
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1	2b	7.99	
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2	2b	8.62	10
2	2b	9.00	6
2	2b	9.34	6
2	3b	9.88	6
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2	3b	2.78	6
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2	4f	4.80	8
2	2f	5.23	6
2	3b	5.72	8
2	2b	6.20	6
2	4b	6.64	8
2	2b	7.13	3
2	3b	7.56	5
2	3f	8.00	8
2	2b	8.42	4
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2	2b	5960.40	8
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2	4m	1.70	2
2	2f	2.26	2
1	2b	2.70*	
1	2f	2.92	
1	2b	3.07*	
2	3f	3.42	4
2	2f	3.82	5
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1	3f	7.43	
1	2b	7.63*	
2	3b	7.90	6
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2	4f	8.47	5
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1	4f	9.26	
1	3f	9.45*	
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2	3b	3.72	2
2	3b	4.16	6
2	2b	4.68	4
2	2b	5.06	1
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2	3b	5.80	4
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1	3b	6.40*	
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2	2f	9.50	4
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1	3b	1.08*	
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2	4f	2.76	2
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1	3b	4.52*	
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2	2b	5.62	7
2	4f	6.16	4
2	2f	6.62	4
2	3b	7.05	1
2	2f	7.42	1
1	2b	7.71*	
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2	3f	9.60	4
2	2b	9.98	3
2	4f	5990.56	10
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2	4f	1.40	
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2	3b	6.76	5
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2	2b	7.64	6
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2	2f	8.82	3
2	2f	9.15	3
2	2b	9.82	2
2	2f	6000.28	2
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2	4f	1.14	2
2	2b	1.58	5
1	3b	2.07	
2	3b	2.44	2
2	2b	2.98	16
2	3f	3.40	8
2	2b	3.93	1
1	2b	4.24*	
1	3f	4.46	
1	2b	4.56*	
2	2f	4.90	6
2	3b	5.36	2
2	2b	5.76	2
1	2b	6.04	
2	3f	6.58	1
2	4f	7.06	2
2	2f	7.52	6
2	3f	7.89	8
2	4f	8.50	6
1	4f	8.88*	
1	5f	9.04	
1	2b	9.28*	
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2	3b	9.98	2
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2	2b	4.52	6
2	3b	5.00	6
2	2b	5.30	5
2	2f	5.72	10
2	2b	6.23	4
2	2b	6.78	1
2	4f	7.20	6
2	3b	7.68	2
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2	4b	1.90	9
2	2f	2.28	6
2	2f	2.62	5
1	3b	2.89	
2	3f	3.32	2
2	4f	3.76	1
1	2b	4.07*	
1	3f	6024.26	
1	2b	4.42*	
1	3b	5.10*	
1	3b	5.55*	
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2	2b	6.40	2
2	2f	6.86	4
2	3f	7.32	6
2	3b	7.64	2
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2	2b	8.54	6
2	3f	9.08	10
2	3b	9.46	2
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6030.36			1
		0.70	
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2	2b	3.82	4
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2	4f	4.92	0
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2	2b	5.83	1
2	2b	6.37	5
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2	2b	7.22	6
2	2b	7.72	2
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1	2b	8.52*	
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1	2b	8.89*	
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6040.04			6
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2	2f	3.52	2
2	3b	4.02	2
2	2b	4.41	2
2	3f	4.90	2
2	2b	5.30	4
2	3b	5.70	4
2	2b	6.14	1
2	2b	6.52	2
2	2b	6.90	0
2	2f	7.34	4
2	3b	7.79	1
2	3b	8.18	12
2	2b	8.58	2
2	3f	8.96	0
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2	2b	9.78	
2	3f	9.99	2
6050.48			2
2	3f	1.00	0
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2	4f	2.89	4
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2	3f	4.32	8
1	3b	4.68*	
1	2b	4.89	
1	2b	5.05*	
2	3b	5.35	4
2	4f	5.80	4
2	3b	6.28	0
2	3f	6.73	3
2	3f	7.22	4
1	2b	7.48	
2	3b	7.78	0
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2	3b	8.76	3
2	2f	9.17	5
1	2b	9.45*	
1	5f	9.70	
1	2b	9.92*	
6060.29*			
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1	2b	0.70*	
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2	2b	1.56	1
2	3f	1.94	3
1	3f	2.44	
1	2f	2.92	
1	3b	3.47	
1	3b	3.97	
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1	2b	5.76	
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1	3b	9.79	
6070.21			
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N	I	λ	d
1	2f	6072.36	
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1	3b	7.07	
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1	2b	8.96	
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1	3f	2.70	
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2	3f	2.66	1
2	3f	3.12	1
2	2f	3.56	1
2	3f	3.94	0
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1	3f	2.76*	
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2	2b	7.78	4
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2	3f	2.86	4
2	2f	3.40	0
2	4m	3.86	1
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2	3b	6.48	1
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2	4f	5.30	1
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2	3b	4.55	7
2	3f	5.16	2
2	2f	5.53	5
2	2b	5.86	2
2	2b	6.22	1
2	2b	6.56	1
2	4f	7.06	1
2	3f	7.54	2
2	2b	7.86	7
2	4f	8.25	2
2	4f	8.78	2
2	3b	9.20	1
2	2f	9.64	4
2	4f	6180.05	3
2	2b	0.62	4
2	3f	1.10	1
1	2b	1.35	
2	2b	1.54	4
2	4b	1.97	2
2	3b	2.42	2
1	2b	2.76*	
1	4b	2.92	
1	2b	3.16*	
2	2b	3.53	6
2	3b	3.96	6
1	3b	4.30*	
1	3b	4.51	
1	2b	4.68*	
2	4b	5.18	1
2	3f	5.62	2
1	2b	5.90	
2	3b	6.30	1
1	3b	6.72	
1	2b	7.07	
1	3b	7.44	
1	3f	7.92	
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1	3b	8.78	
1	3b	9.12	
1	3b	9.58	
1	3b	6190.02	
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1	3b	0.62	
1	3b	0.97	
1	3b	1.40	
1	3f	1.84	
1	2b	2.27	
1	2b	2.69	
1	2b	2.87	
1	1f	3.10	
1	4f	3.50	
1	3f	4.07	
1	3f	4.53	
1	2b	4.87	
1	3b	5.18	
1	3b	5.47	
1	3f	5.90	
1	2f	6.31	
1	4f	6.78	
1	2b	7.08	
2	4m	7.46	0
2	2f	7.84	4
2	4f	8.32	4
2	3b	8.74	4
2	3b	9.24	8
2	3b	9.71	3
2	3b	6200.16	2
1	2b	0.47	
2	2b	0.74	1
2	2b	1.14	6
2	3b	1.60	2
2	2f	2.00	2
2	3f	2.38	1
2	4b	2.74	1
2	2b	3.16	4
2	4b	3.54	4
2	2b	3.98	2
2	2b	4.40	1
2	2b	4.68	2
2	3f	5.08	1
2	3f	5.46	1
2	2f	5.82	1
2	3f	6.18	1
2	2b	6.51	2
2	2f	6.99	0
2	3b	7.37	1
2	2f	7.74	2
3	3m	8.16	3
1	2b	8.54*	
1	4f	8.86	
1	5b	9.00*	
2	2f	9.29	1
2	3f	9.66	5
2	2f	6210.04	2
2	2b	0.34	1
2	3b	0.76	1
2	2f	1.11	0
2	2f	1.54	2
2	3f	6211.98	2
2	2f	2.44	4
2	3m	2.84	0
2	2b	3.26	0
2	3f	3.78	2
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2	3b	4.79	4
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2	3b	5.54	2
2	3b	5.98	1
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2	2b	6.88	4
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1	2b	9.19*	
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1	2b	9.90	
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2	4f	3.29	2
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2	3b	4.56	8
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1	3b	5.94	
2	3f	6.42	2
2	4b	6.89	0
2	4f	7.32	2
1	3b	7.65	
1	2f	7.99	
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1	3b	8.87	
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1	2b	2.93	
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1	3f	4.80	
1	3f	5.41	
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